

"Can Do" No More? An Assessment of Seabee Compensation

Anita U. Hattiangadi
with
Henry S. Griffis • David Gregory

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Summary

In recent years, the Seabee community has become increasingly concerned about its ability to recruit and retain skilled enlisted personnel. Some contend that the Seabees' expanded mission, which includes a host of peacekeeping and humanitarian efforts, and hectic deployment schedule have further exacerbated shortfalls caused by a strong economic environment. There is also concern that additional compensation provided to Seabees for arduous working conditions is insufficient, particularly when compared to pay received by other deployed enlisted personnel. And some believe that recent sea pay increases for the sea-going ratings will likely worsen the Seabees' comparative recruiting, retention, and manning position.

In response to these concerns, the Chief of Civil Engineers asked the Center for Naval Analyses (CNA) to assess the need for an additional Seabee compensation. To accomplish this task, we first compared the Seabees' relative recruiting, retention, and manning climate to that of several comparison groups.¹

Our assessment of the recruiting climate found that:

- The Seabee recruiting climate is comparable to that for other similar groups. But because the Seabee force was cut by a relatively smaller amount during the military drawdown, the Seabees have had to compete for a larger share of recruits in the post-drawdown era.
- The quality of *new* Seabee recruits (as measured by high school degree status and test scores) has decreased relative to several of our comparison groups in recent years, although their

1. These groups are Hull, Mechanical, and Electrical (HME), Surface Engineering (SE), and Aviation (AV). See appendix A for a full description of these groups.

quality seems to be improving relative to that of all new Navy recruits. However, relative increases in boot camp attrition suggest that unobserved quality (that not measurable by degree status or test scores) may be worsening.

Our examination of the retention climate, which includes both attrition and reenlistment, determined that:

- Seabee attrition from sea duty in zone A (those with 0 to 6 years of service) is relatively higher than that experienced by our comparison groups. This trend persists even when Naval Mobile Construction Battalion (NMCB) personnel are compared only to their shipboard counterparts.
- In zone B (those with 7 to 10 years of service), Seabee attrition from shore duty (perhaps due to an anticipated return to sea) recently has risen.
- In terms of reenlistment, Seabees fare relatively well as compared to our other groups.
- Relatively higher Seabee reenlistment rates minimize the adverse effects of higher observed attrition rates. Seabees are at relatively low risk of experiencing a seniority shortfall within the next 20 years due to retirements from the force.

Finally, our examination of the manning climate found that:

- Seabee sea manning—even of NMCBs—is adequate and overall levels surpass those experienced by our comparison groups. Manning of non-occupational field 13 (non-OF-13) Seabee billets (for example, Mess Management Specialist and Store Keeper billets within NMCBs) also closely tracks levels for similar shipboard billets.
- Seabees have realized some sea shortfalls by rating and pay-grade—with notable deficiencies in mid- and senior-grade manning levels. These deficiencies are similar to those experienced by the two comparison groups that have personnel who serve on ships and earn sea pay during their sea duty.
- Seabee shore manning levels also fall below authorized levels.

Drawing this information together, we find substantial similarities among the recruiting, retention, and manning environments of Seabees and our comparison groups. In some cases—particularly in terms of sea duty attrition—Seabees suffer from relatively worse conditions. And, most important, Seabees suffer from similar mid- and senior-grade manning shortfalls as our sea-going comparison groups. This finding suggests that recent measures that provide additional pay to sea-going personnel without providing a comparably sized amount to Seabees could worsen the Seabee community's relative standing. In analyzing a pay "fix" similar in size to the enhanced sea pay "fix" given to sea-going personnel, we estimate a Seabee compensation of approximately \$4.3 million annually, assuming eligibility for such pay is extended to all Seabees (both OF-13s and non-OF-13s) in NMCBs. Estimates rise if pay is extended to all enlisted Naval Construction Force (NCF) personnel.

In addition to these efficiency justifications, new Seabee compensation can also be justified on equity grounds. The Seabees' rigorous deployment schedule, the inadequacy of current deployment-related pays, and Seabees' ineligibility for meals per diem all indicate that a new pay could raise satisfaction levels among the Seabee force. In some cases, non-monetary fixes (for example, allowing non-OF-13s' sea duty counters to advance during attachment to NCF units, even if they do not receive sea pay) also could improve Seabee satisfaction.

Finally, there are several feasible structures for a new Seabee compensation. Although a sea-pay equivalent pay might be most effective, creation of such a pay may be hindered by political obstacles. A good second-best, short-term strategy could be to increase the amount of per diem (either through the meals or incidental expenses rate) available to Seabees. Such a move could do much to improve the equity standing of enlisted Seabees, but may not improve efficiency conditions. As such, a distribution incentive pay, coupled with a targeted Selective Reenlistment Bonus (SRB), could be instituted in the longer run. This approach would allow the services to build on existing successes in designing new pays that are as flexible and integrated as possible.

Introduction

The only trouble with the Seabees is that we don't have enough of them.

—General Douglas MacArthur [1]

Established during World War II and popularized by a wartime-era John Wayne movie, "Seabees" are enlisted Navy personnel assigned to Naval Construction Force units.² Seabees are responsible for a variety of tasks, including construction of advance bases, roads, bridges, airstrips, and buildings, as well as maintenance work at overseas bases. Because they must additionally serve as a fighting force, Seabees are also trained in combat tactics and weaponry.

Active-duty Seabees are organized into Naval Mobile Construction Battalions (NMCBs), Amphibious Construction Battalions (ACBs), Underwater Construction Teams (UCTs), or Construction Battalion Units (CBUs), and typically operate as self-sufficient units. As such, they deploy with enlisted personnel from a variety of other ratings, including Mess Management Specialists (MSs), Dental Technicians (DTs), and Personnelmen (PNs).³

Because of the nature of the Seabees' task, work usually takes place in remote, and often harsh, environments.⁴ In addition to coping with difficult work environments, Seabees also face a sometimes grueling deployment schedule. Unlike most of their counterparts in other ratings, Seabees are currently exempted from PERSTEMPO rules regarding deployment lengths and deployment turn-around ratios.⁵

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2. See appendix B for an analysis of Seabees' demographic data.
 3. These Seabees in non-construction ratings will be referred to as "non-OF-13 Seabees" or "non-OF-13s" for short in what follows.
 4. For example, Seabee details have ranged from advance base construction in Vietnam during wartime to the construction of expansive fleet support facilities in Diego Garcia during peacetime.
 5. See OPNAV instruction 3000.13B.

As such, the current pace of Seabee deployments is 6 months deployed, 10 months in home port—a change from the 7 months deployed, 7 months in home port cycle that was in place prior to FY02 [2].

In recent years, the Seabee community has become increasingly concerned about its ability to recruit and retain skilled enlisted personnel. Several factors contribute to this concern: the Seabees' expanded mission, their hectic deployment schedule, and the perception that they receive insufficient amounts of deployment-related compensation. Because of these concerns, the Chief of Civil Engineers asked the Center for Naval Analyses (CNA) to analyze Seabee compensation. This paper documents this effort.

For the purposes of our analysis, we focus attention on occupational field 13 (OF-13) Seabees in seven ratings: Builder (BU), Construction Electrician (CE), Construction Mechanic (CM), Engineering Aide (EA), Equipment Operator (EO), Steelworker (SW), and Utilitiesman (UT). Those at the E-9 level are compressed into three other ratings: Utilitiesman (UC), which is a consolidation of those in the CE and UT ratings; Equipmentman (EQ), which is a consolidation of those in the CM and EO ratings; and Constructionman (CU), which is a consolidation of those in the BU, EA, and SW ratings.⁶

Outline

First, we examine the Seabee recruiting environment.⁷ We will study the quantity and quality of Seabee recruits over time, and will compare the Seabees' recruiting climate to that of other similar enlisted groups.

Next, we will analyze Seabee retention data, including fleet attrition rates and reenlistment rates. We focus on zone B (those with 7 to 10

6. To maintain a more homogenous analysis group, we exclude unrated Seabee constructionmen, CNs, and those with a diver, EOD, or SEAL NECs from our sample.

7. To facilitate comparisons over time, we examine data over the late 1980s to 2001 time frame.

years of service) reenlistment rates, which are of particular concern to some because they are reported to have fallen sharply in recent years. As a means of comparison, we will contrast the Seabee retention climate with that of several enlisted comparison groups.

We will also assess the Seabee manning climate, both at shore and at sea. As the relative surplus of senior personnel created by the military drawdown dwindles, there is concern that personnel are being promoted more quickly to fill vacant senior billets—meeting current manning needs at the expense of future ones. In addition, smaller cohort sizes over time could result in a smaller supply of qualified future personnel even if recruiting, retention, and attrition rates were to remain constant.

Finally, we will examine the nature of Seabees' deployments and away time and will compare their deployment-related compensation with compensation received by similar enlisted personnel. Recent sea pay increases will also be taken into account. After reviewing these data, we will determine what compensation changes are needed to maintain the readiness of both today's and tomorrow's Seabee force.

Recruiting environment

In this section, we examine the Seabee recruiting environment to assess whether there have been any significant changes in either the quantity or quality of new Seabees over time, and, if so, how these changes compare to those experienced by similar enlisted groups.⁸

Number of new recruits

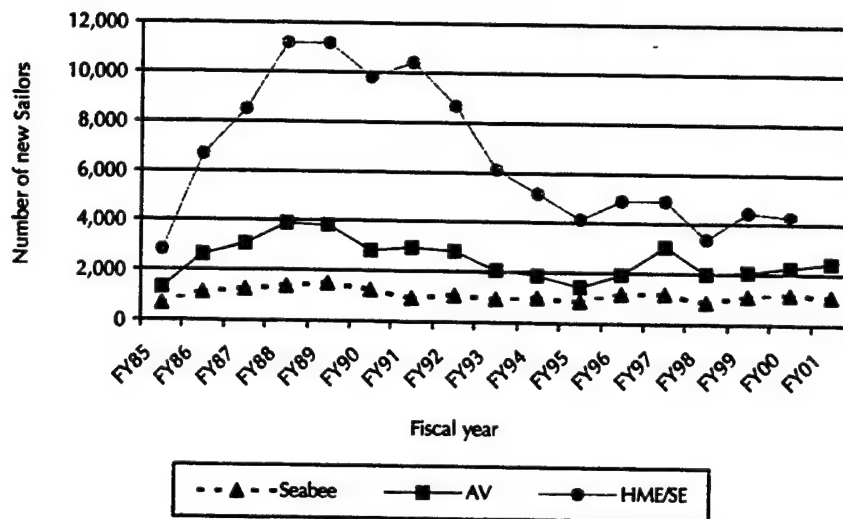
Figure 1 shows the number of new recruits within the Seabees and our comparison groups. The number of new Seabees (as determined by the fiscal year in which a Sailor first gets a Seabee rating) increased significantly prior to the drawdown, peaking at over 1,500. Over the course of the drawdown, the number of new Seabees fell by about 43 percent, reached a low in FY98 when the Navy first missed its annual accession goal, and has increased since that time. Today, the number of new Seabees stands 26 percent below its pre-drawdown peak.

Although the HME and SE groups have a much larger base population, it is useful to compare their pattern of growth and decline over time to that of the Seabees. Although both groups experienced declines over the course of the drawdown, their pattern of decline is more pronounced than that experienced by the Seabees. The number of new Sailors in our HME and SE groups also peaked prior to the drawdown, but then decreased dramatically. The population now stands at about 4,300—62 percent below its pre-drawdown peak.

The AV group, which is only about twice the size as the Seabee group, also experienced more pronounced new Sailor decreases over the drawdown. Although both populations peaked prior to the drawdown (around FY89) and fell to a post-drawdown low in FY95, drops among the AV population were much more severe.

8. These groups are Hull, Mechanical, and Electrical; Surface Engineering; and Aviation. See appendix A for a full description of these groups.

Figure 1. Seabee drawdown-induced accession decreases relatively smaller than for comparison groups^{a,b}



a. Source: CNA tabulations of Enlisted Master Record data.

b. Note: FY01 data not yet available for HME/SE groups.

Smaller Seabee accession cuts have several important implications. To a degree, they indicate that the Seabee force did not have a lot of extra personnel to cut during the drawdown, since it was already quite small. Yet, size cannot be the only factor, since the AV group's accessions fell significantly despite its relatively small size. Thus, the Seabee community may have already been at a minimum level needed for mission accomplishment. Differences between these communities' relative cuts may indicate that the Seabee community has had to continue substantial recruiting efforts even in the post-drawdown era.

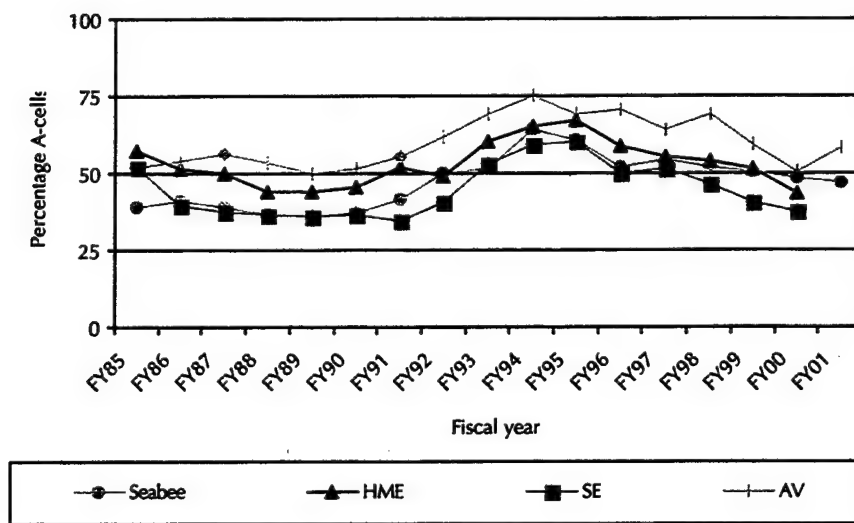
Quality of new recruits

Assessing the Seabee recruiting environment also requires an examination of how new Seabee quality has changed over time, and how changes compare with those experienced by other enlisted groups.

New Seabee quality peaked toward the end of the drawdown, when almost 64 percent of newly rated Seabees were A cells and relatively

small shares were non-graduates (B cells and D cells). The share of new Seabees that are A cells has decreased by 27 percent since, while the non-graduate share has increased. This increase in non-graduate recruits is the likely cause of some concern in the Seabee community.

Figure 2. Similar quality of new sailors in comparison groups^{a,b}

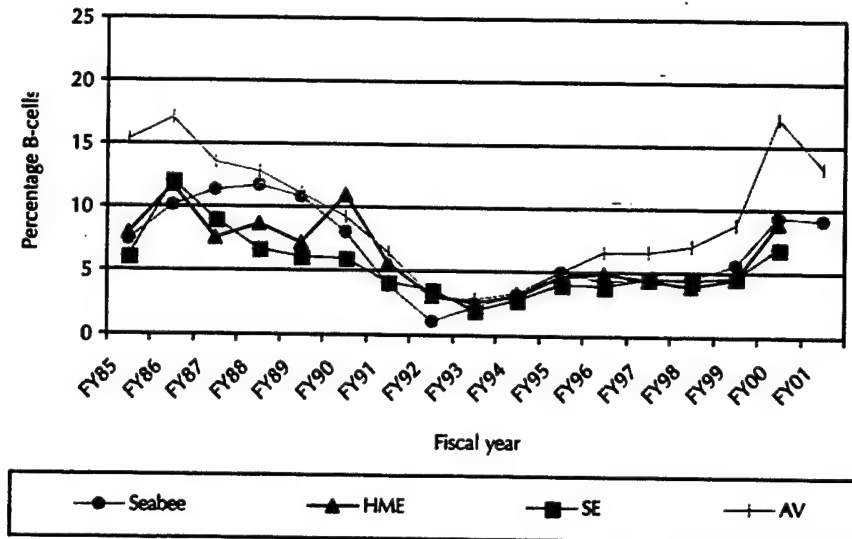


a. Source: CNA tabulations of EMR data.

b. Note: FY01 data for the HME and SE groups not yet available due to lagged values.

To put these changes in context, figure 2 charts the share of Seabee A cell recruits against those for the HME, SE, and AV groups. Changes in Seabee recruit quality have closely tracked those experienced by the other groups (particularly the HME and SE groups) over time—indicative of similar recruiting environments. However, figure 3 shows that concern in the Seabee community about a downturn in the recruiting environment may be due to the rising relative share of B cell recruits. In FY92, the Seabee B cell share was the lowest of all four groups. Since FY98, however, the Seabee B cell share has surpassed both the HME and SE groups' shares. Despite this increase, the Seabee B cell share still remains well below that of the AV group.

Figure 3. Share of new Seabee B cells up recently^{a,b}



a. Source: CNA tabulations of EMR data.

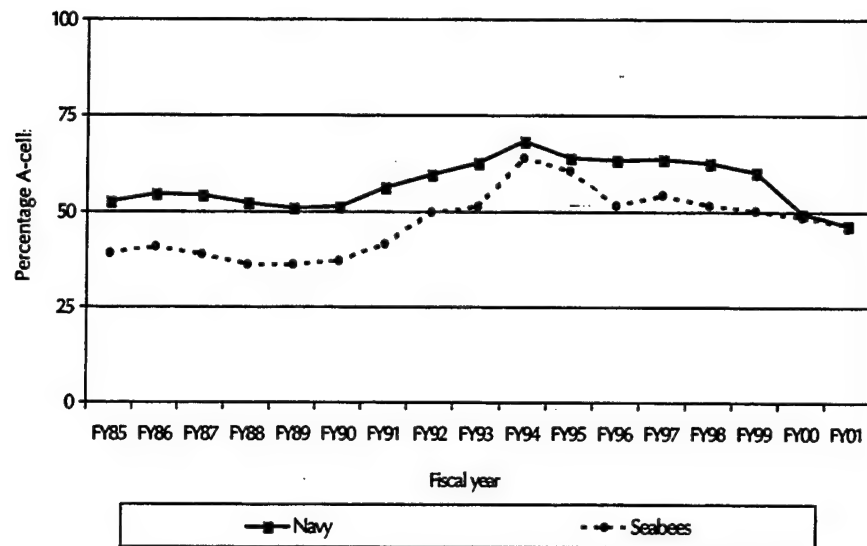
b. Note: FY01 data for the HME and SE groups not yet available due to lagged values.

To examine these changes more closely, we compare Seabee recruit quality to that of all new Navy recruits over time (figure 4). We see that although new Seabee quality (as measured by the share of A cell recruits) fell below that of all new Navy recruits over this time period, the quality difference has diminished in recent years. In fact, new Navy and Seabee recruits had very similar quality in FY01.

This information can be combined with Recruit Training Center (RTC) losses over time. As figure 5 shows, Seabee RTC attrition has remained below Navy-wide attrition since the early 1990s.⁹ In the last several years, however, the rate of Seabee boot camp losses has climbed above the all-Navy rate, despite relative improvements in Seabee recruit quality over the period. Because boot camp attrition is linked to recruit quality, this may indicate that the unobserved quality of new Seabee recruits recently has begun to deteriorate.

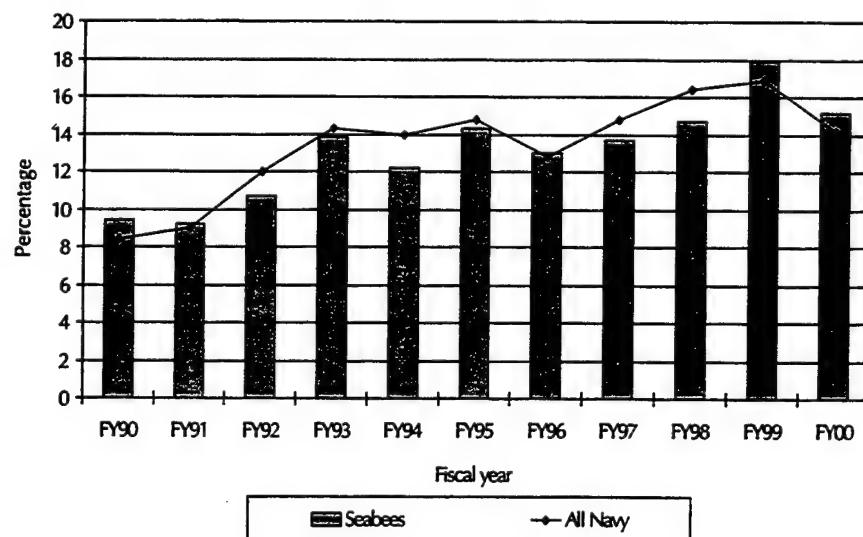
9. Although contrasting Seabee boot camp attrition with that experienced by the HME, SE, and AV groups would be optimal, we cannot make this comparison due to our inability to identify comparison group members before they have reached the fleet.

Figure 4. Quality of new Seabees as compared to all new Navy sailors^a



a. Source: CNA tabulations of EMR data.

Figure 5. RTC attrition: Are new Seabees showing trend toward lower quality?^{a,b}



a. Source: CNA tabulations of EMR data.

b. Note: FY01 data not yet available.

Recruiting environment summary

In summary, we find that the Seabee recruiting climate is comparable to that for our HME, SE, and AV groups. Seabee accessions are down from their pre-drawdown peak, but not to as great an extent as within our comparison groups. This difference may indicate that the Seabee community has had to continue substantial recruiting efforts even in the post-drawdown era.

In terms of recruit quality, we find that new Seabee quality has decreased relative to the HME and SE groups in the past several years. Although the measurable quality of new Seabee recruits relative to all Navy seems to be improving, relative increases in boot camp attrition suggest that unobserved quality may be worsening.

Retention environment

We now examine the Seabee retention environment, which includes fleet attrition and reenlistment.¹⁰ Specifically, we investigate whether reenlistment rates have declined over time, and how any changes in the Seabee retention environment compare with those experienced by our selected comparison groups.¹¹ In appendix C, we create an inventory aging model to project whether current Seabee continuation rates will present a problem as the relative surplus of senior personnel created during the drawdown starts to dwindle due to retirements.

Attrition

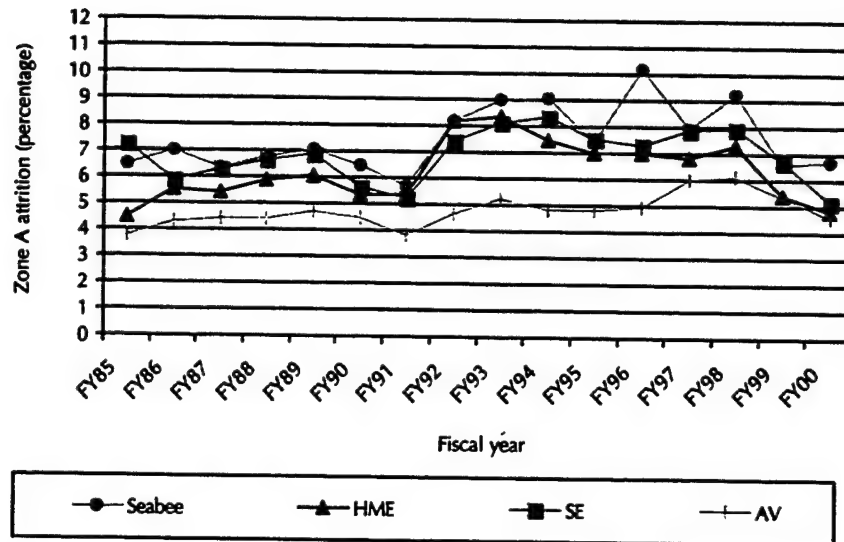
Fleet attrition (which excludes losses at the end of obligated service) is also a concern to the Seabee community. Determining when in the sea/shore rotation attrites occur is of particular interest. For example, if a sea tour is especially unpleasant, we may observe higher attrition for those sailors compared with members of our comparison groups.

Enlisted Navy personnel typically spend their first tour at sea, followed by a second tour at shore. As such, we first examine fleet attrition rates from sea duty for those in zone A (those with 0 to 6 years of service). As figure 6 shows, Seabee zone A sea duty attrition is higher than rates for our comparison groups over much of the time period. In FY00, the Seabee zone A sea duty attrition rate outpaced rates for all three comparison groups. This finding may indicate a problem with the relative attractiveness of a Seabee sea tour.

10. In what follows, we use the Navy's new reenlistment definition. We believe this measure to be more accurate in capturing behavior than retention, which includes attrition, and the old reenlistment definition, which excluded those classified as ineligible for reenlistment.

11. We also hoped to analyze attrition and reenlistment data for non-OF-13s, but were unable to do so due to very small sample sizes.

Figure 6. Zone A fleet attrition from sea duty higher for Seabees^{a,b}



a. Source: CNA tabulations of EMR data.

b. Note: FY01 data not yet available.

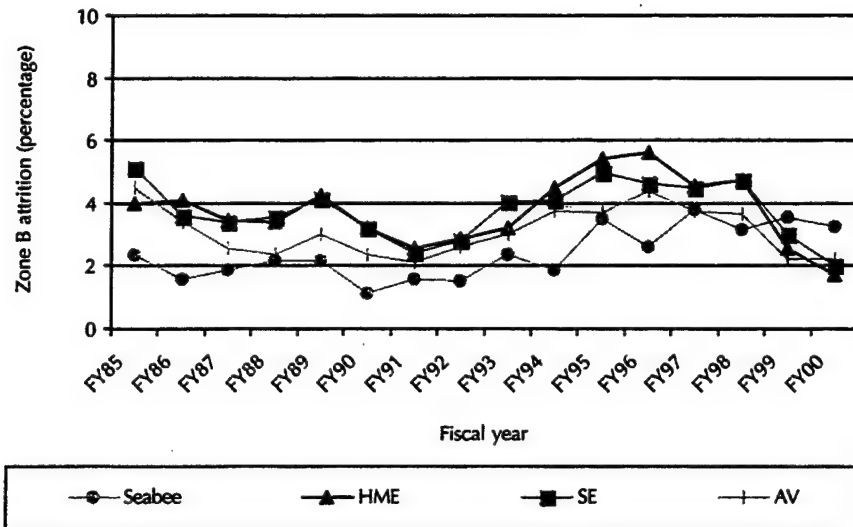
Because individuals on sea duty may not necessarily be attached to a ship, we also compare Seabees on NMCB sea duty to individuals in the comparison groups who served their sea duty assigned to ships/squadrons. However, we find little difference in the attrition trend for the broader group and for this more select group of individuals.

Next, we examine fleet attrition rates from shore duty for those in zone B. Here, we observe that Seabee rates tracked below those of all our comparison groups over most of the period (figure 7). In the last several years, however, zone B fleet attrition from shore duty has risen—surpassing rates for all three of the comparison groups in both FY99 and FY00. This trend may warrant some concern since many Seabees are at shore during these service years.

Reenlistment

Reenlistment rates also provide a useful indicator of the retention climate, since they reflect the willingness of enlisted Seabees to stay in the Navy. As figure 8 shows, Seabee reenlistment rates in zone A are

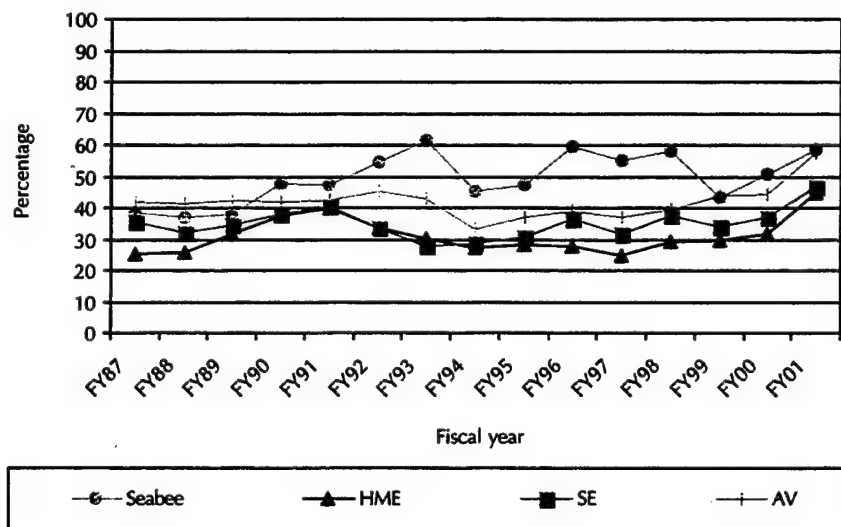
Figure 7. Zone B fleet attrition from shore duty also worsening^{a,b}



a. Source: CNA tabulations of EMR data.

b. Note: FY01 data not yet available.

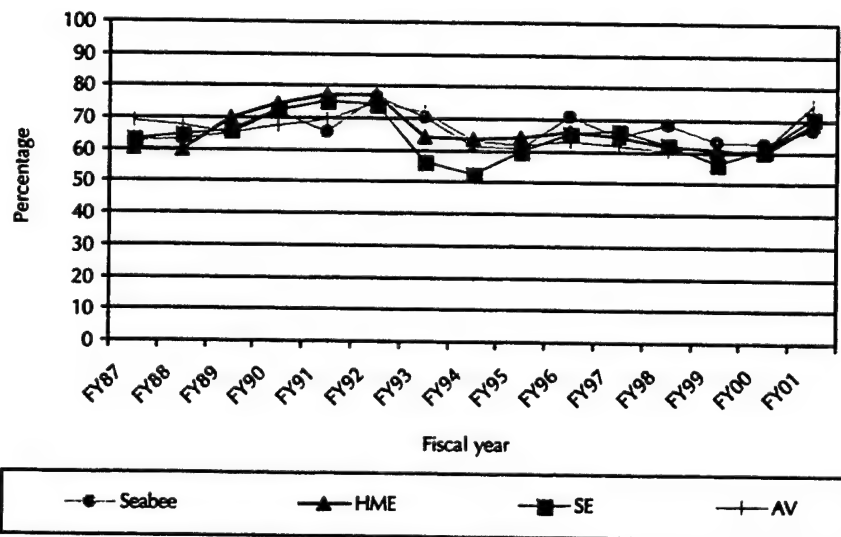
Figure 8. Seabee zone A reenlistment beats comparison groups^a



a. Source: CNA tabulations of EMR data.

actually higher than those for all selected comparison groups over most of the time period examined. This finding suggests that Seabee reenlistment rates are relatively good for those with 0 to 6 years of service. This could also reflect the fact that those who currently receive sea pay during their sea tours find reenlistment to shore duty relatively less attractive. However, in zone B, the Seabee reenlistment rate is more in line with those of the comparison groups—falling over the course of the drawdown and then recovering (figure 9). Because Seabees typically reenlist for their second sea tour after 8 years of service, the reported reenlistment rate includes this decision point.¹²

Figure 9. Seabee zone B reenlistment on par with comparison groups^a



a. Source: CNA tabulations of EMR data.

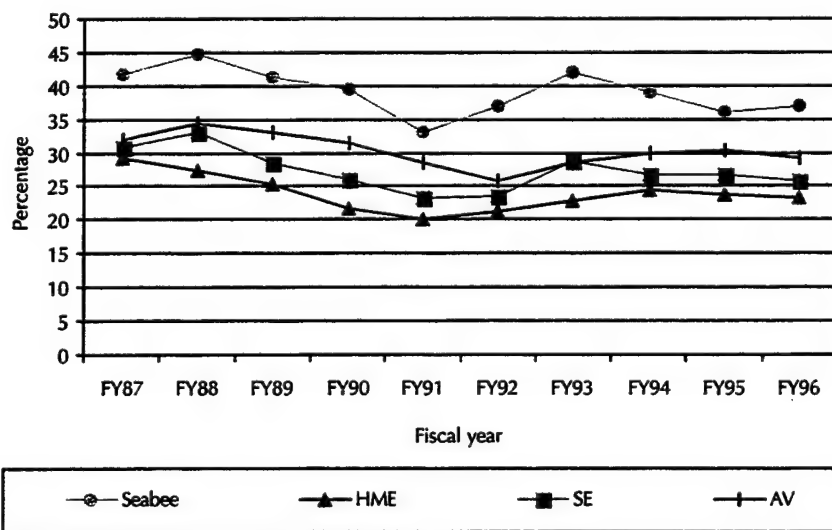
12. We also examined whether an anticipated return to (or continuation of) sea duty affects Seabee reenlistment behavior, by analyzing data for full-duty individuals who would be spending at least 12 of the next 24 months at sea. We found that, despite concern, there is little evidence that Seabees reenlist for sea duty at lower rates than typically occur within the comparison groups.

Putting attrition and reenlistment together

These data indicate that—in relation to our comparison groups—Seabees are experiencing relatively higher fleet attrition from sea duty coupled with relatively higher reenlistment rates. Taken together, these findings may suggest that fleet attrition from sea duty is concentrated among lower quality individuals, leaving a higher quality pool of those eligible for reenlistment.

To assess which effect—higher attrition or higher reenlistment—dominates, we examine 5-year survival rates of enlisted cohorts. These data allow us to determine the combined effect of attrition and reenlistment on cohort size over time. As figure 10 shows, Seabee survival rates are relatively higher than those observed within our comparison groups. This suggests that relatively higher Seabee reenlistment rates outweigh the community's relatively worse attrition standing.

Figure 10. Putting attrition and reenlistment together: 5-year survival rates across zone A^a



a. Source: CNA tabulations of EMR data.

Finally, in appendix C, we assess how these attrition and reenlistment trends will affect the development of the future Seabee force. Our results suggest that—unlike our comparison groups—the Seabee force is not facing imminent shortfalls of senior personnel due to aging and retirements in the force.

Retention environment summary

We find that Seabee attrition rates—particularly from sea duty in zone A—are relatively higher than those experienced by our comparison groups. This trend persists even if NMCB personnel are compared just to their shipboard counterparts. In zone B, Seabees have experienced relative increases in shore duty attrition over the last several years. It remains to be seen whether this is a short-term anomaly or indicative of a new trend.

In terms of reenlistment, the Seabees fare well relative to our comparison groups. Zone A reenlistment rates exceed those for all three other groups, and zone B reenlistment rates are similar to those experienced by the other communities. Since zone A reenlistments are more likely to coincide with a rotation to shore, the zone A result may indicate that shore duty is relatively less attractive within our sea-going comparison groups since it entails a consequent loss in sea pay. When reenlistment to sea duty is tabulated separately, Seabee rates are comparable to those in the HME, SE, and AV groups.

Pulling this information together, we find that relatively higher Seabee reenlistment rates minimize the adverse effects of higher observed attrition rates.

Manning environment

We now consider the Seabee manning environment. We first assess whether Seabee sea billets (especially those with NMCBs) are currently undermanned, and—if so—whether this situation has worsened over time. We find that Seabee sea manning has not experienced a recent downturn as some have feared. In fact, it stood at 99.7 percent in FY01. Focusing on just NMCB manning, we find a similar trend; NMCB sea manning topped 100 percent in FY01. It should be noted, however, that manning levels are down from the sustained high levels experienced during the late 1980s, perhaps contributing to anxiety about current manning levels.

An analysis of manning levels by rating shows that current sea manning levels vary by Seabee rating (figure 11). About half of the Seabee ratings are currently overmanned, whereas three ratings (CM, EO, and UT) are undermanned. Two of the undermanned ratings, CM and EO, are relatively large, which could be a cause for some concern.

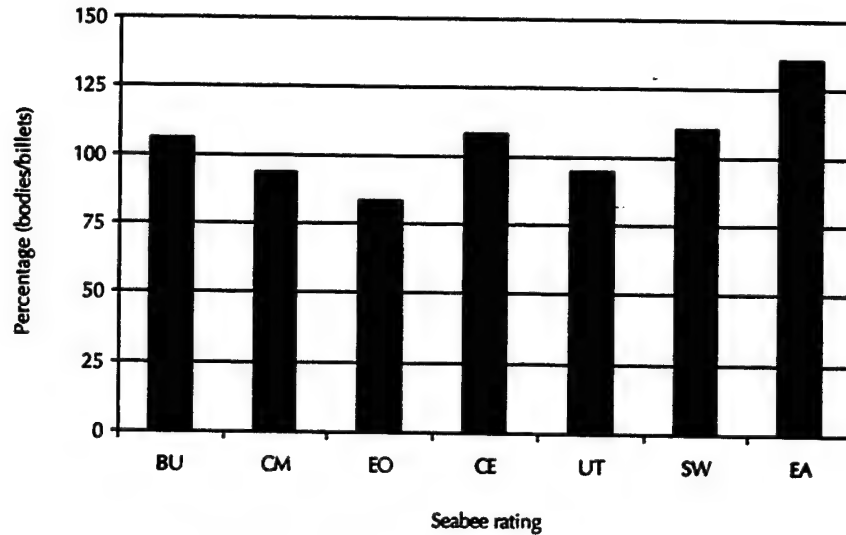
Despite falling levels over time, Seabee sea manning looks quite favorable compared to that of other groups. As figure 12 shows, NMCB sea manning surpasses shipboard manning levels for our comparison groups, and has done so for most of the FY87-FY01 period.

It is also telling, however, to examine sea manning levels by paygrade. Here we find sustained mid- and senior-grade enlisted sea manning shortfalls in NMCBs (figure 13). This pattern is mirrored in data on most individual Seabee ratings.¹³ These deficiencies suggest that concern within the Seabee community about the stock of mid- and senior-grade petty officers may be warranted.

It is important, however, to establish whether these shortfalls are indicative of a problem only within the Seabee community or whether

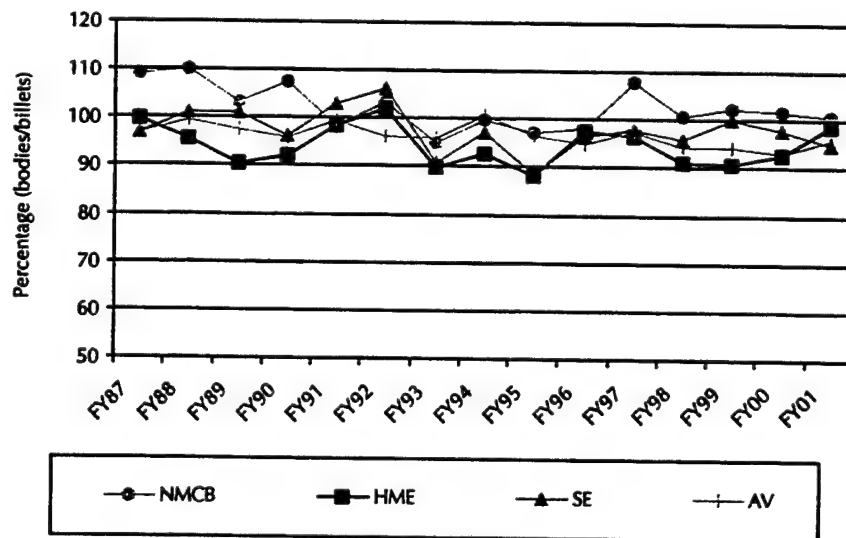
13. Only the CE, EA, and UT ratings have been close to fully manned at sea in the mid- and senior-grades over the last several years.

Figure 11. Current sea manning varies by Seabee rating^{a,b}



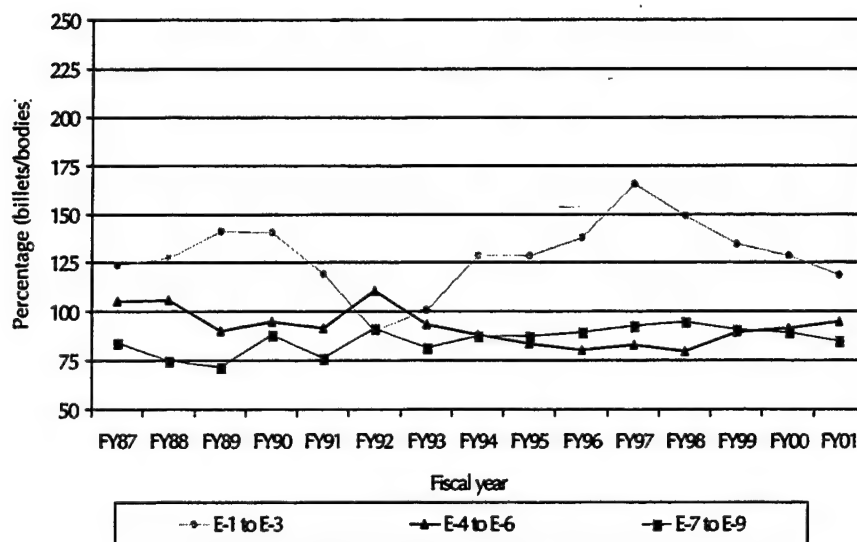
a. Source: CNA tabulations of EMR and billet file data.
b. Note: CU, EQ, and UC omitted due to small sample sizes.

Figure 12. NMCB manning surpasses ship/squadron manning levels^a



a. Source: CNA tabulations of EMR and billet file data.

Figure 13. Mid- and senior-grade NMCB sea shortfalls persist^a

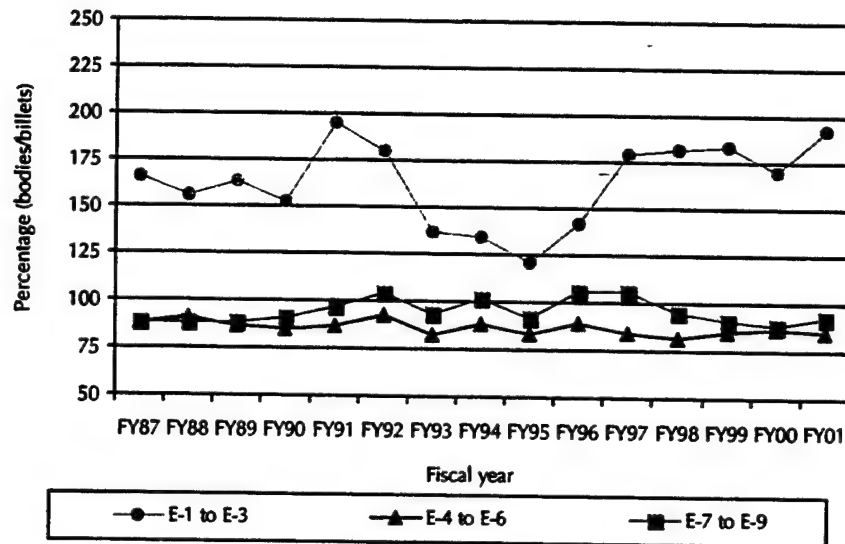


a. Source: CNA tabulations of EMR and billet file data.

they affect other similar communities. To put these paygrade shortfalls in context, we contrast them with shipboard sea manning levels for our comparison groups. As figure 14 shows, the HME and SE comparison groups are also experiencing mid- and senior-grade personnel sea shortfalls. However, as figure 15 shows, the AV group currently has no such mid- and senior-grade shortfall, but does lack adequate numbers of junior personnel. Thus, it appears that all examined communities are suffering from some sea shortfalls. Although junior personnel shortfalls can be remedied with increased recruiting, mid- and senior-grade shortfalls are more difficult to solve. These shortfalls must be addressed to ensure the readiness of the future force.

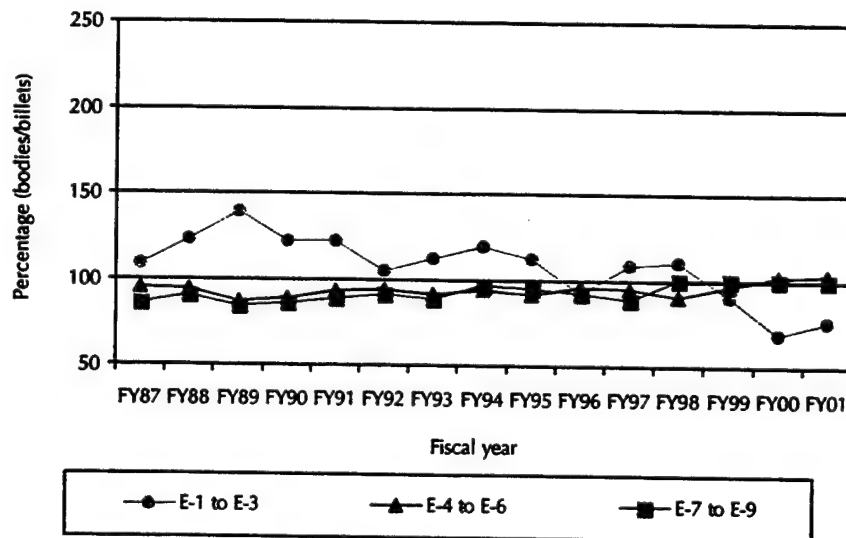
Some suggest that NMCB sea manning statistics are misleading because recruiters and detailers must often go to great lengths to ensure that NMCBs deploy fully manned. Although we cannot measure the extent of these efforts, we can assess whether Seabee shore manning levels are being compromised to meet at-sea manning requirements. Figure 16 tracks Seabee shore manning levels over the FY87-01 period. We find that shore manning levels have fallen since

Figure 14. Ship/squadron sea manning in HME/SE groups also shows mid- and senior-grade shortfalls^a



a. Source: CNA tabulations of EMR and billet file data.

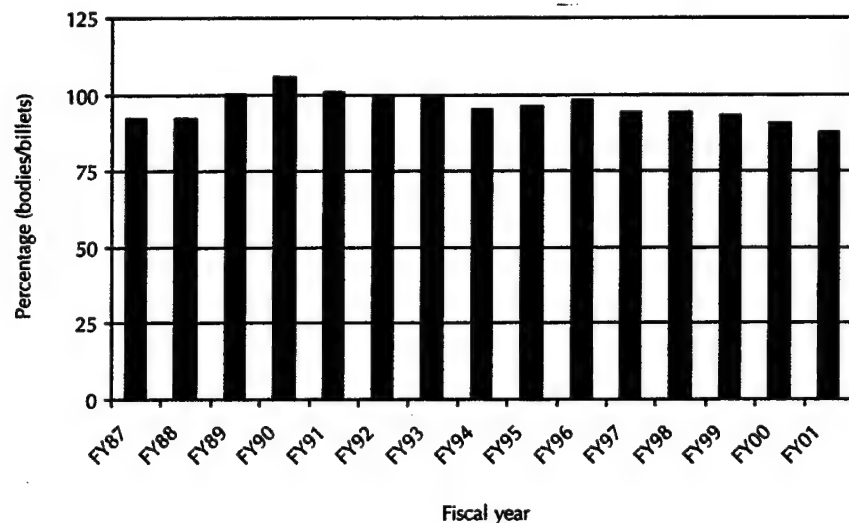
Figure 15. Ship/squadron sea manning in AV group shows junior-grade shortfalls^a



a. Source: CNA tabulations of EMR and billet file data.

the beginning of the military drawdown in the early 1990s, perhaps suggestive of such a manning tradeoff.¹⁴

Figure 16. Seabee shore manning down slightly from pre-drawdown level^a



a. Source: CNA tabulations of EMR and billet file data.

Shore undermanning is even more striking within Seabee ratings. As figure 17 shows, shore billets were undermanned in all OF-13 ratings in FY01.

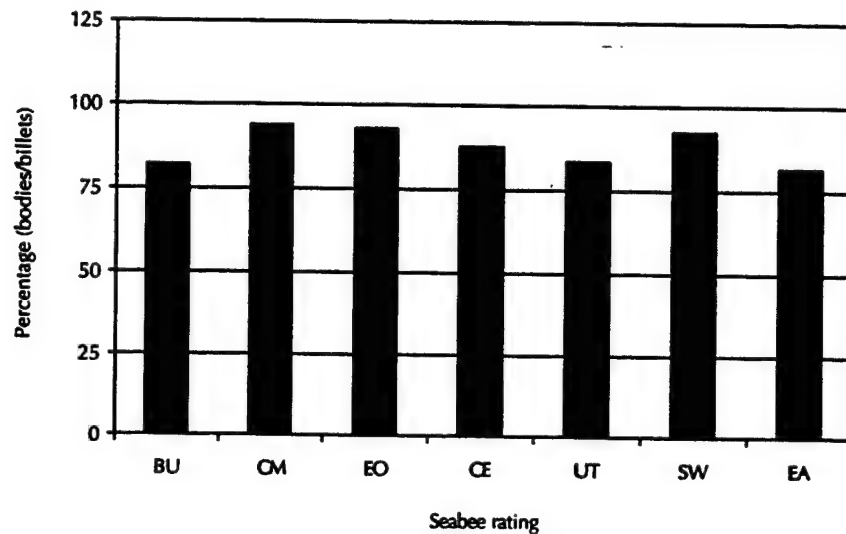
As a final step of our manning analysis, we consider whether non-OF-13 billets within NMCBs are more difficult to fill than those aboard ships.¹⁵ As figure 18 shows, shipboard and NMCB sea manning levels for the largest non-OF-13 rating, MS, track quite closely over time—

14. We are unable to assess shore manning levels within our comparison groups because Sailors both within and not within our comparison groups can fill many shore billets.

15. As noted earlier, we could not complete an analysis of the retention environment for these personnel due to small sample sizes.

showing less than a 5-percentage-point difference since the 1990s. Analysis of the SK group shows a similar trend.

Figure 17. All Seabee ratings currently undermanned at shore, FY01^{a,b}



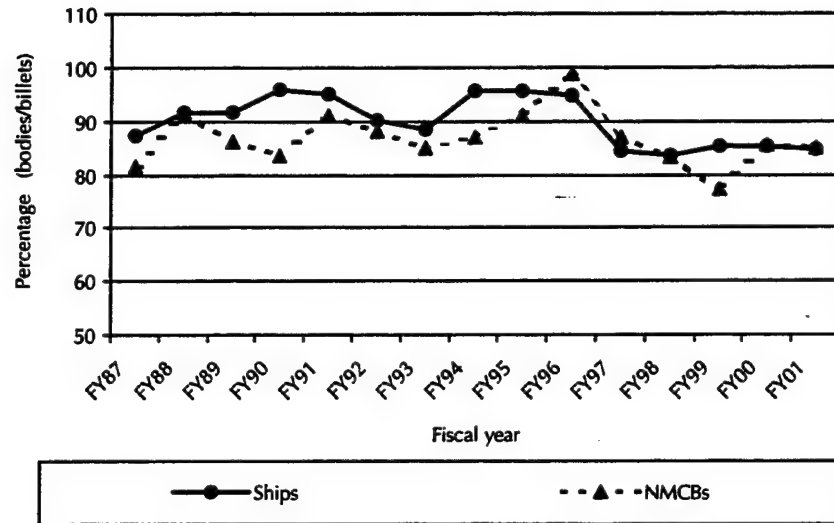
a. Source: CNA tabulations of EMR and billet file data.

b. Note: CU, EQ, and UC omitted due to small sample sizes.

Manning environment summary

To summarize, we find that Seabee sea manning—even of NMCBs—is adequate and surpasses levels experienced by our comparison groups. Non-OF-13 manning also closely tracks levels for similar shipboard billets. The Seabees have, however, realized some sea undermanning by rating, and sustained shore manning shortfalls. Finally, Seabees have experienced sustained mid- and senior-grade sea manning shortfalls. The HME and SE groups have realized similar shortfalls, but the AV group has not experienced such manning deficiencies. As we see in the next section, this difference in manning climates is important, particularly in light of recent sea pay increases.

Figure 18. MS manning for ships and NMCBs track closely^a



a. Source: CNA tabulations of EMR and billet file data.

Assessing the efficiency of Seabee compensation

So far, we have examined the recruiting, retention, and manning climate for Seabees and our selected comparison groups. For the most part, we find similarities in their relative situations—particularly among the Seabee, HME, and SE groups. Given these similarities, recent efforts to correct observed at-sea retention and manning problems through enhanced sea pay deserve attention.

In what follows, we examine the motivation behind recent sea pay enhancements and assess how these changes could affect the Seabee community's relative recruiting, retention, and manning climate. We then estimate the size of a similar compensation "fix" for the problems facing the Seabee community, and determine how such a "fix" could be distributed.

Goals of sea pays and sea pay reform

First instituted in 1835, Career Sea Pay (CSP) is one of the military's oldest special pays.¹⁶ It was originally designed to compensate Sailors for arduous duty, family separation, difficult living conditions, and other factors associated with duty afloat. Although these were CSP's primary goals, the Navy has long recognized its role in helping to fulfill at-sea manning, retention, and distribution needs [3].

Established in 1981, the Career Sea Pay Premium (CSPP) rewards those remaining on long sea tours. Because eligible Sailors are typically close to their first reenlistment point when they begin collecting the premium, it is also an incentive to reenlist into sea duty.

16. Appendix D describes prescribed sea pay amounts and current eligibility rules.

By instituting enhanced sea pay effective October 1, 2001, the Navy fundamentally restructured its sea pay programs to address adverse fleet recruiting, retention, and manning conditions. As the Office of the Chief of Naval Operations stated:

Career sea pay reform is intended to provide [the] Navy with a flexible and targeted tool to provide the incentive required to improve sea/shore balance, increase retention, reduce crew turnover and improve overall fleet readiness....It is also designed to recognize and reward the arduous nature of sea duty [4].

As described in appendix D, there is good evidence that sea pay changes can improve these measures of fleet readiness.

Implications for the Seabee force

Seabee recruiting, retention, and manning

Enhanced sea pay will do much to improve the recruitment, retention, and manning environment for several of our chosen comparison groups (particularly the HME and SE groups). As such, enhanced sea pay will provide a "fix" for the problems facing our comparison groups, but will not improve conditions for those in the Seabee community. Given the reported similarities in these groups' recruiting, retention, and manning environments, this change is likely to prompt a future deterioration in the Seabees' relative standing. Because some Seabee indicators (such as fleet attrition from sea duty) have already lagged in recent years, the move could have serious implications for the viability of the future Seabee force.

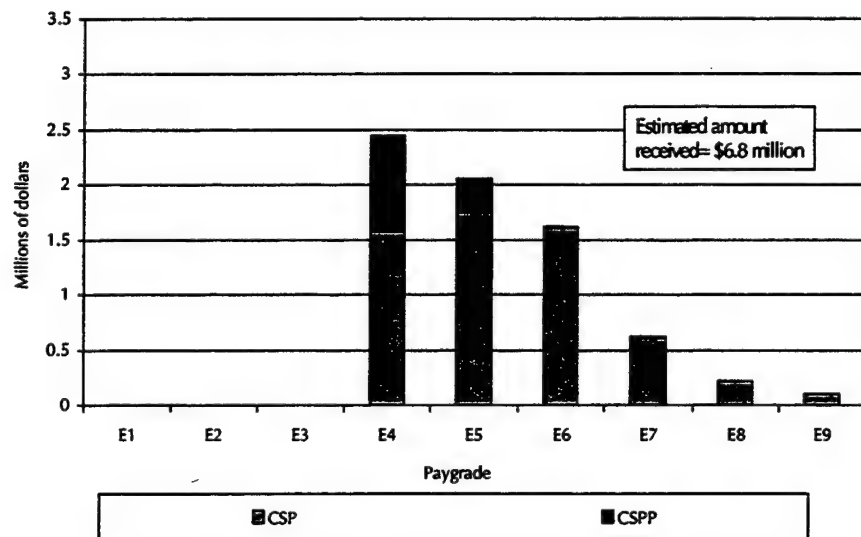
Estimating the size and distribution of the Seabee pay "fix"

To keep the implementation of enhanced sea pay from worsening the Seabees' relative recruiting, retention, and manning environments, Seabee compensation must also rise. Combining FY01 EMR data on Seabees' sea service with information from the old and enhanced sea pay tables, we estimate Seabees' sea pay receipt—if OF-13s in NMCBs were eligible to receive sea pay over the entire course of their sea

tours.¹⁷ We take the difference between these old and enhanced sea pay totals to estimate the size and distribution of a similarly sized Seabee pay “fix.”

Figure 19 shows Seabees’ estimated receipt of sea pays (under the old sea pay tables) if OF-13s in NMCBs were eligible to receive such pays over the course of their sea tours. Seabees would receive an estimated \$6.8 million in sea pays, spread across eligible E-4s to E-9s.¹⁸ In figure 20, we estimate the same number under the enhanced sea pay provisions. Receipt rises to \$10.3 million, with newly eligible E-1–E-3s receiving about 16 percent of total payments.¹⁹

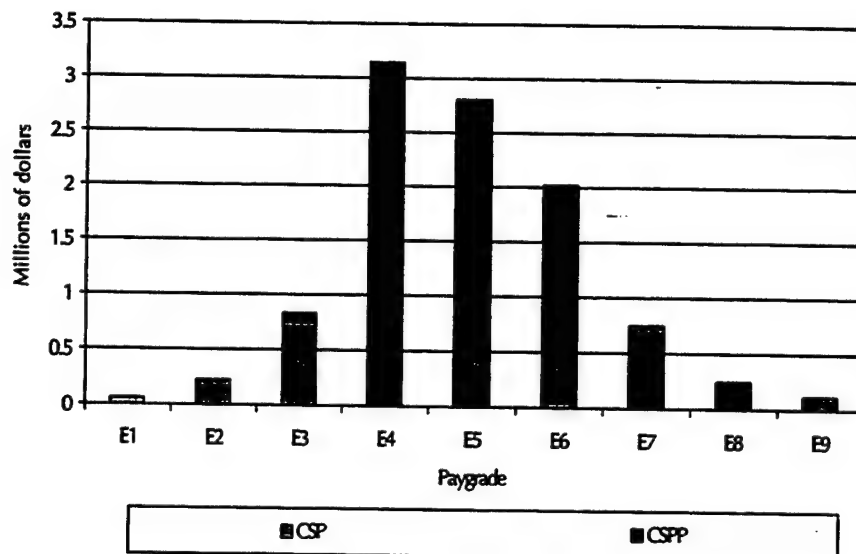
Figure 19. Cost under old sea pays, if NMCBs were eligible^a



a. Source: CNA tabulations of EMR data.

17. Under current eligibility rules, we estimate that OF-13s receive only \$87,338 in sea pays under old sea pay, and \$145,550 under enhanced sea pay. These amounts are subtracted from our final estimates so that the amounts reported indicate additional sea pay receipt.
18. Including non-OF-13s in NMCBs in this estimate increases it to \$8.3 million; also including all UCT personnel raises this figure to \$8.5 million.
19. Including non-OF-13s in NMCBs increases this estimate to \$12.6 million; also including all UCT personnel raises this figure to \$12.8 million.

Figure 20. Cost under enhanced sea pay, if NMCBs were eligible^{a,b}



a. Estimated amount received = \$10.3 million.

b. Source: CNA tabulations of EMR data.

Differencing these amounts, we estimate a \$3.5 million pay “fix” for OF-13 Seabees in NMCBs.²⁰ Almost 30 percent of this total would go to those in the E-4 paygrade. If compensation increases are targeted to those in the mid- to upper paygrades (where Seabees have experienced sustained sea manning shortfalls), the total amount of the pay “fix” falls to \$2.4 million.²¹ Table 1 summarizes these results.

We then examine how this “fix” would increase a Seabee’s career pay. Combining average deployment length data with conservative promotion rate assumptions, we estimate this “fix” would add an additional \$9,355 to a Seabee’s pay over a 20-year career. As appendix D notes, however, sea pay is quite effective in encouraging sea tour extensions. As such, it is likely that the type of compensation “fix” described above would prompt the same response. If Seabees

20. Including non-OF-13s in this estimate increases this “fix” to \$4.3 million.

21. The pay “fix” rises to \$2.9 million if all Seabees in NMCBs are included.

Table 1. Sizing a Seabee compensation based on the Seabee pay "fix"^a

Seabee group	Old sea pays ^b	Enhanced sea pays ^c	Seabee pay "fix" for all grades	Seabee pay "fix" for mid- and senior-grades
OF-13s in NMCBs	\$6.8M	\$10.3M	\$3.5M	\$2.4M
All Seabees in NMCBs	\$8.3M	\$12.6M	\$4.3M	\$2.9M
All Seabees in NMCBs and UCTs	\$8.5M	\$12.8M	\$4.3M	\$2.9M

a. Note: Based on FY01 patterns of Seabee sea duty, reported in millions of dollars.

b. Estimated amount if Seabees were eligible to receive sea pays.

c. Estimated amount if Seabees were eligible to receive sea pays.

extended their first sea tours due to the incentive effect of the pay "fix," they could earn an additional \$12,390 over a career.

Efficiency of Seabee compensation summary

Given similarities in the Seabee, HME, SE, and AV groups' recruiting, retention, and manning environments, to provide sea-going personnel with additional pay (through sea pay reform) without providing Seabees with a comparably sized amount could worsen the Seabee community's relative standing. The cost of this "fix," which is \$3.5 million (if applied just to OF-13s in NMCBs) and \$4.3 million annually (if extended to non-OF-13s in NMCBs), is relatively modest compared to the potential costs of enhanced sea pay (\$10.3 million to \$12.8 million annually) if eligibility for such pay was extended to Seabees. This amount also seems relatively small when compared to the almost \$93 million of estimated cost for E4 to E9 personnel due to the recent sea pay enhancement [3].

Examining the equity of Seabee compensation

In addition to examining the efficiency of an additional Seabee compensation, it is also important to consider whether such a pay is justified on equity grounds. In discussions, Seabee community members raise several equity concerns—including the perceived inadequacy of deployment compensation, disincentive effects for non-OF-13s, and Seabees' ineligibility for some per diem pay.

Frequency, length, and rigor of Seabee deployments

The Seabee force is unique in the way in which it is organized and deployed. As a non-garrison expeditionary force, Seabees have historically gone on longer and more frequent deployments than their shipboard counterparts. For example, PERSTEMPO rules limit ship deployment cycles to 6 months at sea followed by 12 months in home port, whereas the Seabees' cycle has typically been 7 months away followed by 7 months in home port. Due to a recent change, the cycle is 6 months deployed, 10 months in home port as of FY02 [2].

Seabees also deploy to a variety of locations, some of which can entail very harsh living conditions. Although a Seabee battalion may deploy to Rota, Spain, smaller details are then sent out from this location to other, potentially more remote locations. For example, NMCB 3 sent details to Albania and Latvia during its 1999 deployment cycle. Battalions can send out between 8 to 10 of these smaller details annually, each lasting between 30 to 120 days. Typically, these smaller details support training exercises, and are referred to as Deployments for Training (DFTs) [5].

Seabees contend that it is unfair that they receive no additional deployment-related compensation to offset the costs and hardships associated with these more frequent, lengthy, and rigorous deployments. The new HDP-L pay (which replaces Foreign Duty Pay) may help to at least partially compensate Seabees for time spent in harsh

living conditions, but only if Seabees are assigned to an area eligible for the pay and meet the pay's requirements. Recent deployment cycle changes may also help to improve Seabee satisfaction. Finally, the type of compensation "fix" described in the previous section could potentially do much to improve this situation.

Inadequacy of deployment compensation

Even if deployed Seabees currently do not receive an explicit deployment-related compensation, is it possible that they receive amounts of implicit deployment compensations to make up for their non-receipt of sea pays? Previous CNA research has identified a family of special and incentive pays that either explicitly or implicitly compensate individuals for time away from home [6]. These pays are:

- Family Separation Allowance II
- Hostile Fire/Imminent Danger Pay
- Career Sea Pay
- Career Sea Pay Premium
- Overseas Extension Pay
- Foreign Duty Pay.²²

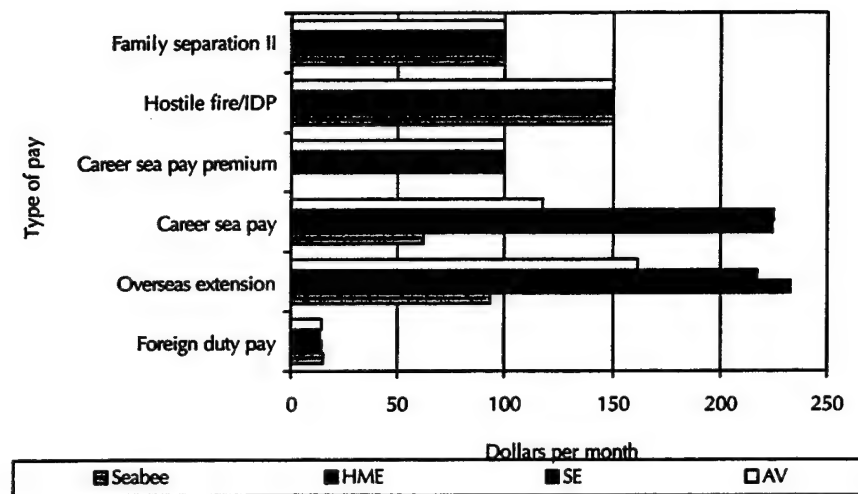
Using September 1999 EMR and JUMPS data, we estimate the total amount of these pays that enlisted Seabees and personnel in our comparison groups receive, and calculate average amounts per recipient, per member on sea duty, and per deployed member.

Figure 21 shows the average amount per recipient of these deployment-related pays received by our four groups. Differences in amounts received are most striking in the case of CSP, CSPP, and the Overseas Tour Extension Incentive Pay. Because of sea pay eligibility rules (described in appendix D), Seabees receive only about \$62 in CSP (and no CSPP) monthly, compared to amounts as high as \$250

22. Since we use FY99 data, some of these pay names and amounts have since changed. For example, the Foreign Duty Pay replacement (Hardship Duty Pay-Location) is payable in substantially higher amounts of \$50 to \$150 monthly.

(with a \$100 average CSPP payment) for the other groups. Similarly, Seabees average only about \$93 in Overseas Tour Extension Incentive Pay, whereas average values for our comparison groups range from \$161 to \$233 monthly.

Figure 21. Average amount of deployment-related pays, per recipient^a



a. Source: Based on CNA tabulations of September 1999 JUMPS and EMR data.

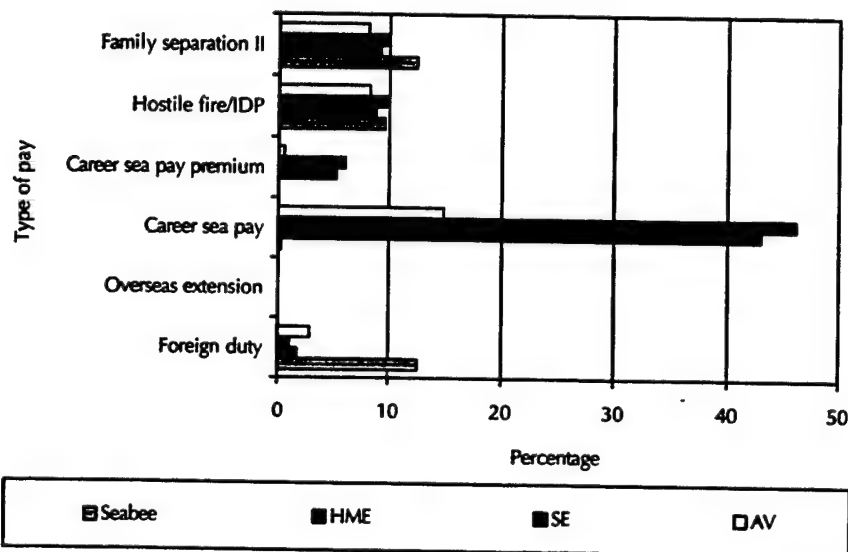
Since values reported are per pay recipient, it is also important to assess how widely these pays are received. Figure 22 shows that few Seabees receive the sea pays offered—less than half of 1 percent in the case of CSP and no Seabees received CSPP in September 1999. Overseas Tour Extension Incentive Pay is received by only a few individuals in all of our groups.

However, Seabees do fare relatively well in their receipt of other non-sea service related deployment pays. A greater share of Seabees receive Family Separation II, Hostile Fire/IDP, and Foreign Duty Pay than those in our comparison groups.

Although information on a per-recipient basis is useful, examining pay received per member on sea duty or per deployed member gives

us a sense of how these pays are used to reward sea tours and deployments. The EMR reports the number of personnel at sea, but we must estimate the number of deployed personnel within our identified groups. To do so, we first identify those on sea tours who also have dependents, then determine the share receiving Family Separation Allowances (FSA). Applying this share to the entire sea duty population yields an estimate of the number of personnel deployed.

Figure 22. Share receiving various deployment-related pays^{a,b}



a. Source: Based on CNA tabulations of September 1999 JUMPS and EMR data.

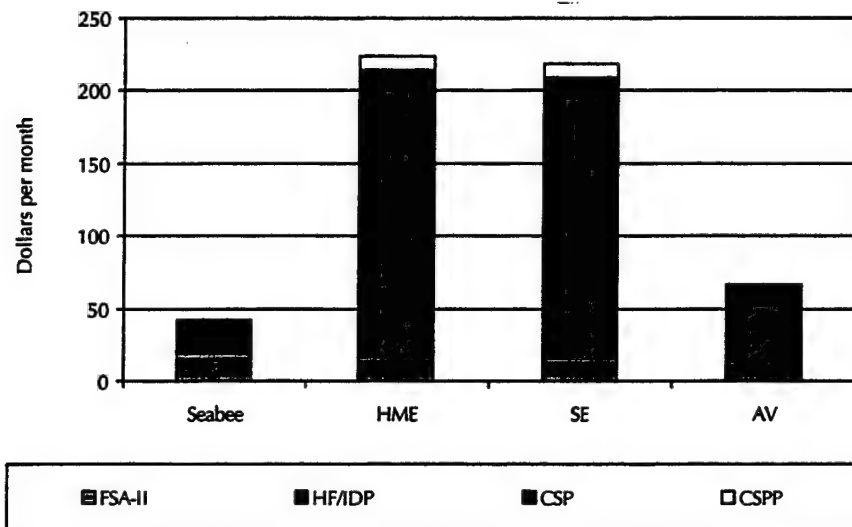
b. Note: Overseas extension shares do not appear because they are very small.

Figures 23 and 24 report the total amount of deployment-related pays that each of our groups receive, either on a per member on sea duty or per deployed member basis.²³ Seabees receive less deployment-related pays than do our comparison groups, primarily because of their non-receipt of sea pays. In the case of the FSA and Hostile Fire Pay, Seabees receive a relatively larger amount on a per member on sea

23. Receipt of Foreign Duty Pay and the Overseas Tour Extension Incentive Pay is so small that we omit these pays from the rest of the analysis.

duty basis, but this amount is relatively lower than in the comparison groups when it is calculated per deployed member.²⁴

Figure 23. Average amount of deployment-related pays, per member on sea duty^a



a. Source: Based on CNA tabulations of September 1999 JUMPS and EMR data.

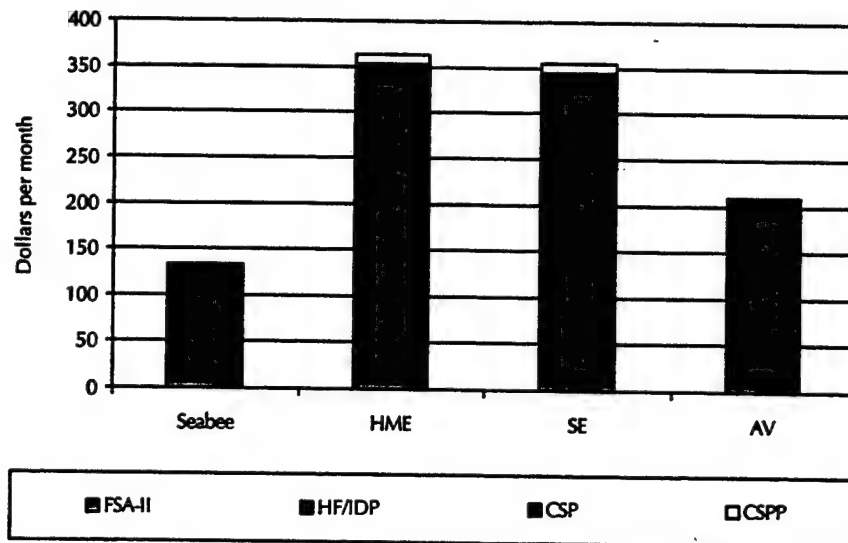
Disincentive effects for non-OF-13 Seabees

Another perceived inequity in Seabee compensation stems from the fact that non-OF-13s sacrifice sea pays during NMCB sea tours. This makes these tours less attractive, particularly in view of recent sea pay enhancements.

To approximate these pay losses for the largest non-OF-13 Seabee group (MSs), we tabulate average deployment length data and make conservative promotion rate assumptions. Combining this information with the sea pay tables, we approximate sea pay losses for a given sea tour with an NMCB.

24. Recent increases in Foreign Duty Pay (i.e., Hardship Duty Pay) may improve this pay's importance in Seabees' future relative pay position.

Figure 24. Average amount of deployment-related pays, per deployed member^a

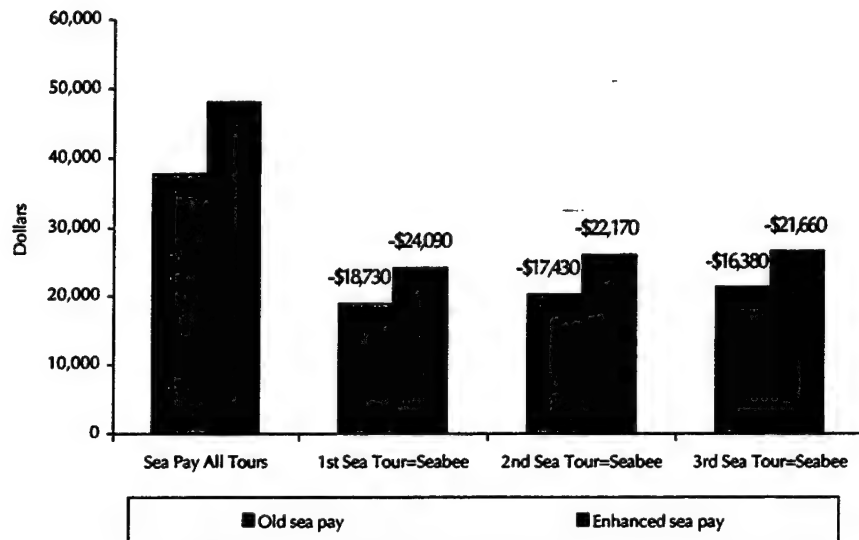


a. Source: Based on CNA tabulations of September 1999 JUMPS and EMR data.

Figure 25 reports career sea pay losses to an MS under the old and new sea pay tables. As the figure illustrates, losses increase by an additional \$4,740 to \$5,360 due to sea pay reform. The percentage increase in the loss is largest for those spending their third sea tour with an NMCB. Similar calculations for SKs (the second largest non-OF-13 group) yield losses of \$16,290 to \$17,340 under old sea pay and \$20,730 to \$22,620 under enhanced sea pay (an additional loss of \$4,440 to \$5,300).

Our calculations show that non-OF-13s incur significant sea pay losses during NMCB sea tours. Since these losses will grow by between 27 and 32 percent under enhanced sea pay, it is vital that Seabees receive additional compensation to offset these losses and retain needed non-OF-13 personnel.

Figure 25. Career sea pay losses to an MS due to an NMCB tour^a



a. Source: CNA tabulations of EMR data.

Non-receipt of meals per diem

Another perceived inequity in Seabee compensation stems from non-receipt of full per diem. Under OSD policy, deployed military personnel (who are not permanently assigned to a vessel) are eligible for a per diem amount for lodging (up to a set maximum) plus a set amount for meals and incidental expenses. Seabees, however, are not eligible for meals per diem. They currently receive only an incidental expenses per diem—\$2.00 per day in CONUS, \$3.50 while OCONUS.

Seabees receive this reduced per diem because the government provides their lodging and food. Unlike most other groups, NMCBs operate their own galleys and deploy with their own complement of MSs, etc., who provide three meals daily to deployed Seabees. There are two reasons for this:

- Paragraph 7 of the The Seabees' POE has been interpreted to require unit self-sufficiency.
- SECNAV Instruction 7220.66C mandates that deployed NMCBs use Essential Unit Messing (EUM).

The Seabees have a unique mission, which historically has been to provide construction support for Navy and Marine Corps forces in unsecured and isolated locations. Self-sufficiency is viewed as key to this mission. Paragraph 7 of the NMCB POE specifies that:

The NMCB has an organic TOA capable of sustaining operational control, planned or envisioned under contingency or general war conditions for 60 days without resupply except ammunition is limited to 15 days, subsistence rations are limited to 5 days, and fuel is limited to 3 days.

In addition to this NMCB POE condition, SECNAV Directive 7220.66C mandates that deployed NMCBs use EUM. EUM is required when it enhances military readiness or is necessary for training, and those under EUM cannot receive the meals per diem.

Under EUM, the discount government meal rate (currently \$6.75/day) is auto-deducted from the Seabees' BAS entitlement (which is approximately \$8.05/day). The BAS deduction is paid into the Navy's applicable financing subsistence account. This is the same system used by shipboard enlisted personnel, who are also ineligible for meals per diem, to pay for provided meals.

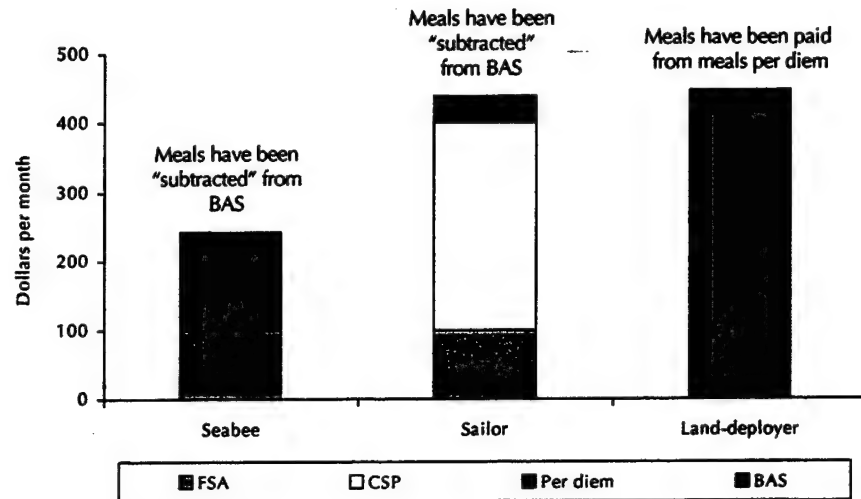
One result of this process is that Seabee galleys receive full ration credit, regardless of the number of meals actually served.²⁵ This credit has allowed Seabee galleys to provide better quality food and services to their customers. This is similar to the provision of meals aboard ships, in which the ship's galley takes full ration credit for all enlisted personnel entitled to rations-in-kind as reported in the daily muster report.

However, the Seabee system differs from that used by other land-based deployers. For example, members of P-3 squadrons (who are not currently subject to EUM) receive a meals per diem, which they can spend either on galley meals or on purchased meals. If P-3 personnel were to spend their entire meals per diem on food, the net

25. One Seabee multiplied by three meals daily = one ration credit, per NAVSUP Publication 486 Volume 1, par 2300.

result of this difference would be that land-deployers retain their entire BAS entitlement. Figure 26 illustrates this point.

Figure 26. Monthly deployment-related pays + BAS for a married E-5



Adding the amount of deployment-related pays plus BAS that a married E-5 receives during a month of deployment (minus meals), we find that Seabees receive considerably less pay than their shipboard or land-deploying counterparts. In the case of the shipboard sailor, extra pay stems from sea pay receipt, while for the land-deployer, the extra pay is the result of retaining the full BAS entitlement.²⁶

Land-based deployers receive the meals per diem at either the proportional meals rate (PMR) (if the squadron deploys to a OCONUS base and personnel are unable to eat three galley meals daily due to their work schedules) or the local or commercial meals rate (CMR) (if the squadron deploys to a site without a base). Those receiving a meals per diem can purchase galley meals at the standard meal rate (currently \$8.10/day) or on the local economy.

26. This is the minimum amount our hypothetical land-deployer would receive—a land-deployer could end up with more pay if he/she does not spend the entire meals per diem on food.

Other service units also have per diem policies and procedures that differ from those of the Seabees. For example, the Marine Corps recently changed its Unit Deployment Program (UDP) per diem policy. Prior to June 2002, enlisted Marines deployed under the program were under EUM orders, whereas officers received a meals per diem based on the 'no government mess available' rate. Effective June 2002, enlisted Marines in the UDP will no longer be in EUM status. Using JFTR authority, which allows the CNP to establish a special per diem rate, the Marine Corps will pay both UDP officers and enlisted a flat rate per diem equal to approximately \$9.60/day—which will serve as a combined meals and incidental expenses per diem. Enlisted galley meals will be auto-deducted from BAS at the discount meal rate. Implicitly, this means that enlisted personnel will now retain their full BAS entitlement, since the auto-deduction and the meals portion of the new per diem will essentially offset each other.

The Air Force's RED HORSES (Rapid Engineer Deployable Heavy Operational Repair Squadron Engineers) are similar in many ways to Seabees and also value self-sufficiency, but these units employ yet another type of per diem policy. Because RED HORSES are not under EUM, they deploy in one of several ways:

- 1) Without mess personnel in CONUS—RED HORSES receive meals per diem at the GMR, PMR, or CMR rate.
- 2) In field duty status OCONUS—mess personnel may deploy with the unit, but the discount meals rate is auto-deducted from BAS and no meals per diem is paid.
- 3) In per diem status OCONUS—mess personnel may deploy with the unit, but BAS is retained and meals per diem (at either the GMR, PMR, or CMR rate) is paid. Galley meals can be purchased at the standard meals rate.

Consequently, if Seabees were to drop their EUM status, it would allow for a variety of per diem options, some of which are outlined in table 2. However, doing so would result in the loss of full ration credit for Seabee galleys, decreasing their funding levels. Thus, dissatisfaction with meals per diems may require the Seabees to choose between

the costs of dropping EUM (and losing full ration credit) or achieving higher Seabee satisfaction.

Table 2. Possible outcomes if Seabees dropped EUM

Condition	Meals per diems available	Ration credit	BAS
Unit deploys together	PMR or CMR	Only for meals served	Bo auto-deduct, retain full BAS, pay standard meals rate for purchased galley meals
Individual orders issued	GMR, PMR, or CMR	Only for meals served	No auto-deduct, retain full BAS OR auto-deduct at standard meals rate possible under GMR, pay for galley meals at standard meals rate under PMR or CMR
Unit deploys together	Flat rate M&IE per diem, roughly equal to discount meals rate+\$3.50/day	Only for meals served	Auto-deduct at discount meals rate, retain full BAS

Structure of a Seabee pay “fix”

So far, we have determined the need for a new Seabee compensation and have suggested the amount of compensation warranted. This section considers how to structure this new compensation. We present several options, which vary in their:

- Ability to target equity and efficiency
- Ability to target only Seabees
- Political feasibility
- Cost.

Potential goals of a Seabee pay

Compensation generally targets one or both of two outcomes—efficiency and/or equity. Sponsors may need to prioritize these sometimes competing goals, since different pay vehicles target efficiency and equity to varying degrees.

Pays targeting equity

We first discuss pays that primarily target perceived equity (creating a compensating differential) by providing pay to compensate for deployment hardship—irrespective of paygrade, years of service, and cumulative years of sea duty.

Provide a fixed monthly or daily amount

A daily (per diem) or monthly payment offers the simplest Seabee pay structure. Seabees could receive this pay either over the entire course of their sea tours, or just while deployed.

First, we determine the amount payable if Seabees received the pay over their entire sea tours. Dividing our \$4.3-million pay “fix” among

Seabees in NMCBs and then dividing again to obtain daily and monthly amounts, we estimate that a Seabee per diem could be set at \$2.50 per day of sea duty, or \$75 monthly.²⁷

Next, we estimate the payment size if it were payable only during deployed days. Dividing the pay "fix" as above to obtain a monthly payment amount, but then multiplying by 16 and dividing by 6 to account for the current deployment cycle, we derive a payment of \$6.50 daily, or \$195 monthly. This amount, however, may be biased, since the \$4.3-million "fix" was based on the recent past when Seabees deployed in a 7-7 cycle. If we instead take the monthly amount and multiply/divide to account for the old deployment cycle, we determine daily and monthly payments of \$5 and \$150, respectively. If this amount were paid over a 6-10 deployment cycle, we find that the total annual outlay to all Seabees in NMCBs would amount to \$3.2 million.

Although a new daily or monthly pay targeting deployed Seabees could be created, it would likely meet with political resistance. However, the values reported above are in keeping with two existing pays that Seabees could employ: the meals per diem and the locality incidental expenses pay.

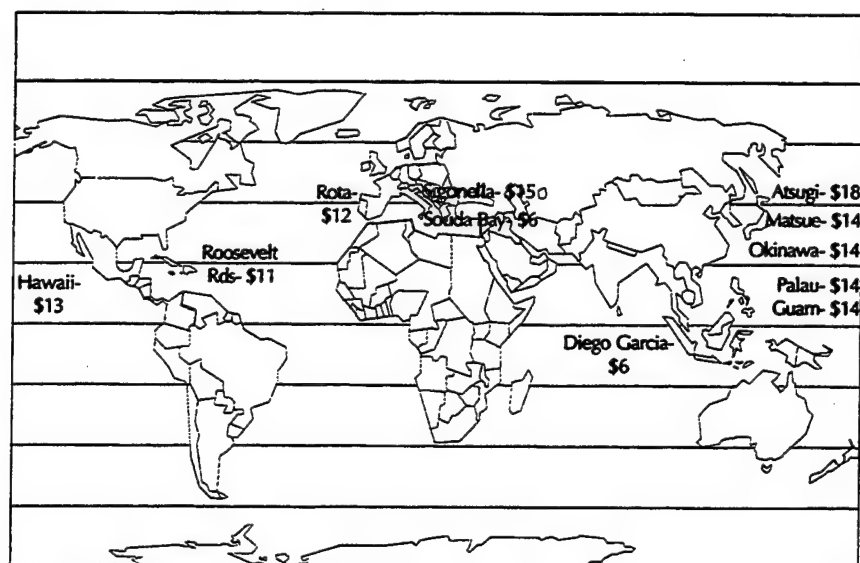
As discussed earlier, Seabees could receive meals per diem if they were removed from EUM status. A meals per diem could allow Seabees to keep up to an additional \$6.75 per day under even the most limited meal option. However, Seabee leadership may see this option as unsatisfactory if it significantly alters the Seabee galleys' current operation.

As such, increasing the incidental expenses portion of the per diem may offer an alternative. JFTR U4125 states that "the order-issuing official can determine that the \$3.50 is not adequate on a U.S. installation and authorize/approve the applicable locality incidental

27. This amount is irrespective of the population included. For example, if we include only OF-13 Seabees in NMCBs in our eligible population, we divide the pay "fix" in that case (\$3.5 million) by the number of OF-13 Seabees in NMCBs (3,951) to derive an estimate of \$2.50 daily, or \$75 monthly. We believe, however, that including both OF-13 and non-OF-13 Seabees in our pay "fix" represents the best pay strategy.

expense rate." This rate is generally higher than \$3.50/day in most locations where Seabees deploy (see figure 27). In fact, some Seabees already may receive these locality rates when taking part in a DFT or Joint Task Force operation, since Joint Task Force commanders and fleet CINCs have some flexibility in selecting per diem options. Monies for this per diem come from the OMN budget.

Figure 27. Locality incidental expense rates



If Seabees were issued individual orders, locality incidental expense rates conceivably could be authorized for those in paygrades suffering at-sea shortfalls—allowing the pay to target Seabee manning problems.

Extend HDP-L

Extending Hardship Duty Pay-Location (HDP-L) to areas where Seabees frequently deploy (or are sent on detail) could also improve equity through a flat rate payment.

Implemented in January 2001, HDP-L is available to servicemembers in OCONUS land or ice shelf areas where living conditions are substantially below servicemembers' living conditions within CONUS.

FY01 HDP-L pay rates are set at \$50, \$100, or \$150 per month, varying by the severity of the location's hardships.

Criteria for HDP-L designation include hardship associated with the physical environment, living conditions, and personal security and related factors. Initial locations were set to mirror those that the U.S. State Department has designated as eligible for the Hardship Differential for Federal Civilian Employees, but will eventually be determined using a Hardship Location Assessment Questionnaire.

Using HDP-L as a proxy for a new Seabee pay, however, has several disadvantages. First, HDP-L is only payable when a location has multiple associated hardships, which may not be the case for Seabee deployment/detail locations. For example, an uncomfortable physical environment may qualify as one hardship, but this alone is not enough to warrant HDP-L. Additionally, Seabees assigned temporary duty in an HDP-L area would not be eligible for the pay for the first 30 days, but would receive the pay retroactively after that period. If most details are relatively short, this pay may not fully meet deployed Seabees' needs. Finally, HDP-L pay rates and areas are set to meet all services' needs, and apply to both sea- and shore-based personnel. As such, HDP-L could not be targeted to meet the specific needs of the Seabee community. For these reasons, it is unlikely that this pay vehicle could provide Seabees with sufficient additional compensation.

Create HDP-Tempo

When the services developed the two current types of Hardship Duty Pay (HDP-M and HDP-L), they also considered an HDP recognizing high PERSTEMPO (HDP-Tempo, or HDP-T). HDP-T was deemed necessary because new patterns of operations created risks and hardships that were not always covered by existing pays. The pay was never approved, however, because of its cost, disagreements about thresholds, and the pending implementation of ITEMPO pay.

When HDP-T was originally proposed, it was set to begin when a servicemember spent more than 4 out of 12 months away from home. The Army agreed to this measure, but the Air Force favored a lower threshold of 3 out of 12 months. Both the Navy and Marine Corps

found the threshold to be too low, since typical Navy and Marine Corps deployments are 6 months long. Furthermore, Navy and Marine Corps personnel already could receive sea pays during at least part of this time away. Because Seabees are more like deploying Army and Air Force personnel who do not currently receive sea pay, a lower threshold—say, 3 to 4 months—might be more appropriate for a deployment pay.

HDP-T was eventually set aside because of the ITEMPO implementation. ITEMPO pay was considered sufficiently difficult to adopt quickly, but its purpose was quite different from the type of deployment pay the services had originally envisioned. By setting the pay at \$100/day and mandating a 400/730-day threshold, the legislation ensured that the pay served more as a penalty to the services than as a reward to servicemembers. Because of its high rate, the services are unlikely to ever allow many people to qualify for this pay.²⁸ Seabees may have eventually qualified for ITEMPO due to their historically more demanding deployment schedule, but the recent deployment cycle change was made, in part, to avoid these anticipated expenses.²⁹

Pays targeting efficiency

Although the pays described thus far are relatively simple in structure, they may not provide the best vehicles for a new Seabee compensation. For example, each would be payable to many Seabees who are early in their first term. This means pay is not targeting the career force. Using sea pay as a model argues for the more focused distribution of pay. Indeed, to truly maximize the effectiveness of a pay, it must be concentrated at points in a career when it is most likely to elicit desired behavioral changes.

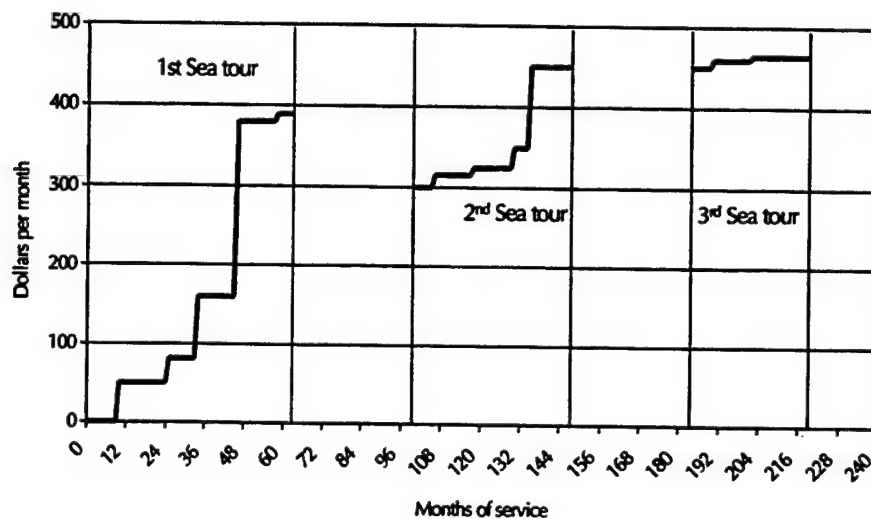
28. There has recently been discussion of revising ITEMPO to function more as a reward pay or adding an HDP-T pay. As discussed, the pay could reward both cumulative sea time (e.g., 425 days over 2 years) as well as continuous days of deployment (e.g., 190+ continuous days), but crafting of such a pay is still preliminary and subject to change.

29. One report estimates that Seabees sent to deploying units at certain times in the rotation cycle could have exceeded the ITEMPO threshold by over 20 days [7]. As of this writing, ITEMPO (in its current form) has been suspended due to the conflict in Afghanistan [8].

As such, we next consider pay structures that target compensation based on retention and manning conditions.

As described in appendix D, there is good evidence that sea pay promotes sea tour extensions, helps to more effectively distribute personnel, and encourages lower attrition and higher reenlistment rates. Figure 28 shows the pattern of sea pay receipt, if Seabees were eligible for such pays.

Figure 28. Pattern of sea pay receipt if Seabees were eligible for sea pays^a



a. CNA tabulations of EMR and billet file data.

In what follows, we explore pay structures that are variants of sea pay or a deployment-related pay.

Create a scaled-down sea-pay equivalent for Seabees

One option is to create a new Seabee sea-pay equivalent similar in structure to sea pay. Although it is unlikely that such a pay would be funded at the same level as current sea pays, amounts could be scaled to remain under the \$4.3-million annual amount estimated above.

One advantage of a Seabee sea-pay equivalent is that it would not require an exact count of deployed days. Instead, a sea tour would serve as a proxy for an assignment that requires significant away time.

The disadvantage of a Seabee sea-pay equivalent is that it requires creation of a whole new pay. As such, it is likely to generate hostility—particularly among other servicemembers who spend significant time away from home or who deploy on land.

Extend distribution incentive pay and combine with SRBs

Finally, we consider what other pay vehicles could approximate the structure of sea pay. As figure 28 showed, a pay similar in structure to sea pay would require a fairly large payment at the end of the first sea tour, followed by another large payment toward the end of the second tour and over the entire course of the third sea tour. One option for replicating this structure is to implement a first-term Selective Reenlistment Bonus (SRB) coupled with a distribution incentive pay.

SRBs are awarded to enlisted members serving in select ratings or NECs who reenlist or extend their enlistment for at least 3 years. A targeted SRB, which is payable to those assigned to a particular location, provides a more focused compensation option. The purpose of these bonuses, which vary by paygrade, is to increase reenlistments for those in ratings or NECs that have insufficient retention.³⁰ We saw earlier that manning problems vary considerably by rating, so this would allow the Seabee community to focus SRBs on those in undermanned ratings. With targeted SRBs, the Navy could award bonuses to those reenlisting to duty at certain undesirable locations or to those reenlisting to sea duty.

An SRB could target pay at the end of the first sea tour in a way similar to sea pays. One advantage of the SRB is that the amount and receipt can be changed as conditions change. One disadvantage, from the Seabee perspective, is that competing SRB dollar needs can create situations where a community fails to get the amount of SRB dollars it feels it needs. Another disadvantage of SRBs is that they can only be granted at decision points.

As figure 28 also shows, a pay structured like sea pay also would distribute a significant portion of the pay over the course of the third sea

30. Details of the SRB program are contained in OPNAVINST 1160.6A.

tour. This structure could be mirrored through the use of a distribution incentive pay.

As proposed, distribution incentive pay is intended to increase voluntary assignment to certain hard-to-fill billets. It would be a market-based, variable pay (payable monthly) and could be set at any level up to a \$750/month ceiling.

Allowing the market to set distribution incentives and allowing people to volunteer for jobs at bonuses that compensate them for negative attributes has many advantages:

- The benefit can be targeted only where there are manning shortfalls and then can be adjusted to the lowest level that will keep billets fully manned.
- It would allow the Navy to take advantage of differences in tastes for job attributes. Some people may be willing to accept high operating tempos at relatively low premiums, whereas others demand much higher compensation. Voluntary assignments mean that people who have relatively less distaste for a job volunteer first and at lower prices.
- Market prices would force policymakers to pay the full, immediate cost of sending people to remote locations or increasing operations tempo. These costs are incurred even under an involuntary assignment system, but are observed only indirectly through recruiting, attrition, and retention problems.
- Permanent Change of Station (PCS) costs would decrease because there would be less need to rotate people quickly through hard-to-fill assignments to "share the pain."

As proposed, the distribution incentive pay could be adjusted in response to changing conditions and targeted at specific billets with manning problems. For example, because Seabees have experienced sustained manning difficulties for those in paygrades E-4 and above, this pay could be targeted to just those Seabee billets. Non-OF-13 Seabees could be similarly targeted through a distribution incentive pay for Seabee billets.

The disadvantage of a distribution incentive pay strategy, however, is that it is not clear how such a pay would work. As currently envisioned, the pay ideally would be related to how long a critically needed billet goes unfilled. This would be determined by an "auction-style" process, in which increasing amounts of pay would be attached to unfilled billets until servicemembers volunteer to fill them. In the case of a whole ratings group like the Seabees where each sea billet may be viewed as equally undesirable (yet it is necessary that community members each choose one such billet), it is not evident that such a pay would be offered.

Thus, while a distribution incentive pay may indeed be capable of meeting the Seabees' needs, the way in which such a pay would operate must be carefully assessed. It may be possible to modify distribution incentive pay for NMCB billets so that these billets would still be eligible for pay—perhaps by attaching a base level of pay to all Seabee billets before starting the auction process—and such alternatives should be seriously considered.

Broaden use of SDAP

Special Duty Assignment Pay (SDAP) compensates enlisted members in assignments with extremely demanding duties or considerable responsibility. The pay, which ranges between \$55/month and \$275/month³¹ is paid if an active-duty enlisted Sailor:

- Is an E-3 or above and is eligible for basic pay
- Holds an SDAP-eligible NEC
- Is assigned to an SDAP-eligible billet
- Is certified by a commanding officer as actually serving in the SDAP billet for which the payment is received.

The SDAP program, which currently includes about 25,000 Navy billets, could be broadened to include Seabee skills and billets. Since Seabees would receive the pay over the course of their sea tours, even an

31. \$375/month is available only to production recruiters. A maximum payment of up to \$600/month is authorized, but none of services have used this authorization.

amount set at the second-lowest level (currently \$110/month) would adequately meet their needs. One disadvantage of this pay is that the Department of Defense must approve the addition of SDAP-eligible NECs and billets. Furthermore, it may be difficult to use SDAP to target non-OF-13s since it requires designation of an NEC.

Table 3 lists the top five primary NECs held by OF-13s at sea in March. Even if all these NECs (and associated billets) became eligible for SDAP, only about 16 percent of at-sea OF-13s would receive the pay.

Table 3. Primary Seabee NECs that could potentially be used for SDAP, March 2002

Primary NEC	Description	Qualifying group	Percentage of at-sea OF-13 holders
6021	Safety inspector	E-6 to E-8	4.5%
5805	Advanced construction mechanic	E-5 to E-6	3.8%
5501	Construction inspector	E-6 to E-7	3.2%
5710	Advanced equipment operator	E-5 to E-6	2.2%
5635	Advanced construction electrician	E-5 to E-6	2.1%

Costs of pay options

Table 4 reports estimated costs of the pay options considered. Costs for the locality incidental expenses per diem and HDP-L are based on 2001 Atlantic side deployment data and deployment patterns, whereas values are set to match the amount of the Seabee pay "fix" for the sea-pay equivalent pay and the distribution incentive pay + SRB option. The SDAP cost estimate is based on all Seabees (paygrades of E-4 and higher) receiving \$110/monthly. For HDP-T, cost estimates cannot be made until pay thresholds have been set.

We find that, unless many new locations were added, the HDP-L option is unable to offer enough pay to remedy Seabee pay's equity or efficiency. And until fully developed, it is not clear whether or not HDP-T could adequately meet Seabee needs. Remaining pays, however, all seem capable of providing Seabees with compensation levels similar to those needed to address the Seabees' retention and manning conditions.

Table 4. Estimated cost of Seabee pay vehicles

Pay vehicle	Estimated annual cost (\$M)	Caveats
New daily or monthly payment	3.2-4.3	Depends on population targeted
Meals per diem	4.4	Assumes payment at the GMR
Incidentals per diem	4.6	Based on historical Atlantic deployment data
HDP-L	<0.5	Assumes max in current locations, few others added
HDP-T for Seabees	n/a	Amount would depend on pay threshold/amounts set
Sea-pay equivalent for Seabees	4.3	Pay set to match size of the Seabee pay "fix"
Distro pay + SRB	2.9	Set to target mid- and senior-grades
SDAP	3.4	Targets OF-13s in NMCBs (paygrades E-4+)

Thus, we find that we must add to cost estimates information about the pay's ability to target equity and efficiency, its political feasibility (as measured by whether it already exists), and its ability to target the Seabee population to determine which pay or pays are most viable (see table 5).

Table 5. Assessing Seabee pay vehicles

Pay vehicle	Existing pay	For equity	For efficiency	Can be applied just to Seabees	Cost (\$M)
New daily or monthly payment		X		X	3.2-4.3
Meals per diem	X	X		X	4.4
Incidentals per diem	X	X		X	4.6
HDP-T		X			n/a
Sea-pay equivalent pay for Seabees			X	X	4.3
Distro pay/SRB	-/X	-/-	X/X	X/X	2.9
SDAP	X		X		3.4

We conclude that, if an immediate short-term fix is desirable, an existing pay would offer the best strategy. Among existing pays that offer pay in sufficient amounts, the locality incidental expenses per diem may offer the best near-term fix—particularly since the authority to pay it already exists. Payment of either a meals per diem or SDAP would require changes to legislation and/or instructions. In the longer term, the distribution incentive pay + SRB option may best target Seabee retention and manning problems and may be more politically palatable than a Seabee sea-pay equivalent.

Providing Seabees with additional compensation will keep their relative recruiting, retention, and manning environments from worsening. In doing so, the Navy can ensure that the Seabees "Can Do" for many years to come.

Appendix A: Selecting appropriate Seabee comparison groups

In this appendix, we identify several groups that are sufficiently similar to the Seabees so that we can accurately differentiate Seabee-specific manpower trends from more general ones. For example, falling retention rates must be tempered with knowledge of external shocks that could have affected multiple groups. Comparison groups also help us to determine the relative severity of changes in recruiting, retention, and manning observed over time.

Selecting appropriate Seabee comparison groups requires consideration of several important issues. Obviously, no rating or ratings group will be a perfect match, but there may be several ratings that can be comparable, given a specified criteria.

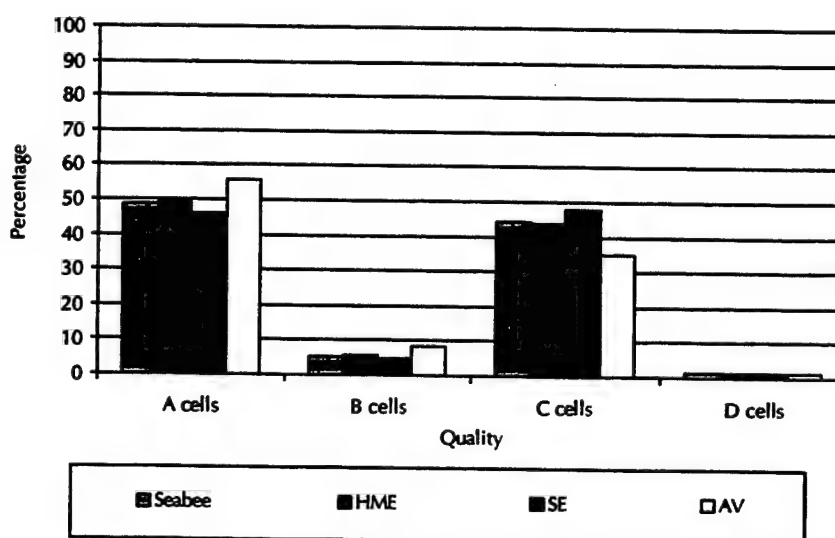
The criteria for comparability can include skill level, time away, age, or paygrade, for example. Although "All Navy Enlisted" is often used, we chose not to use this group (except in the case of recruitment, where such comparisons are valid) because of its wide diversity in skill levels, deployment schedules, quality, etc. Rather, we defined comparison groups by skill level. We selected three enlisted ratings groups:

- Hull, Mechanical, and Electrical (HME)—includes Damage Controlmen (DCs), Electrician's Mates (EMs), Hull Maintenance Technicians (HTs), Interior Communications Electricians (ICs), and Machinery Repairmen (MRs)
- Surface Engineering (SE)—includes Enginemen (ENs), Gas Turbine System Technicians (GSs), Gas Turbine System Technicians—Electrical (GSEs), Gas Turbine System Technicians—Mechanical (GSMs), and Machinist's Mates (MMs)
- Aviation (AV)—includes Aviation Structural Mechanics (AMs), Aviation Electrician's Mates (AEs), and Aviation Support Equipment Technicians (ASs).

Although each group contains personnel with similar skill levels as Seabees, we further limit our selection of the HME and SE groups to non-nuclear-field individuals who typically deploy on surface ships.¹

Figure 29 shows the relative quality distribution of the HME, SE, AV, and Seabee groups. The Seabee and HME groups have the most similar quality distributions, whereas the SE group's distribution is slightly lower (with fewer A and B cells and more C and D cells) and the AV group's distribution is slightly higher (with more A and B cells and fewer C and D cells). These differences are important to keep in mind when considering the groups' relative attrition and reenlistment behavior.

Figure 29. Ratings groups provide useful quality comparisons, FY01^a

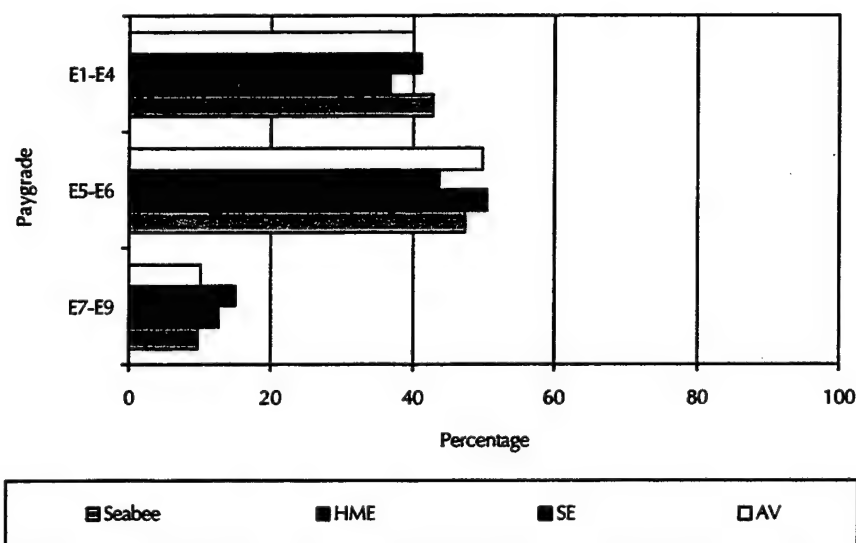


a. Source: CNA tabulations of EMR data.

1. As such, submariners were excluded. This exclusion was deemed necessary because of the wider variety of tasks submariners perform, as well as to facilitate pay comparability in the analysis. We also excluded nuclear field personnel from our comparison groups because of their relatively higher levels of skill and training.

We also examine the paygrade distribution for Seabees and the selected comparison groups. Figure 30 shows shares of junior-, mid-, and senior-grade enlisted for each of the groups. Seabees are relatively more concentrated in the junior grades, with a smaller share of senior-grade enlisted. The AV shares are similar to the Seabees', but are slightly larger in the middle grades. The SE group has a relatively even distribution of people in the junior and middle grades, whereas the HME group has a relatively larger share of mid- and senior-grade enlisted.

Figure 30. Seabees in the fleet have lower paygrade distribution, FY01^a



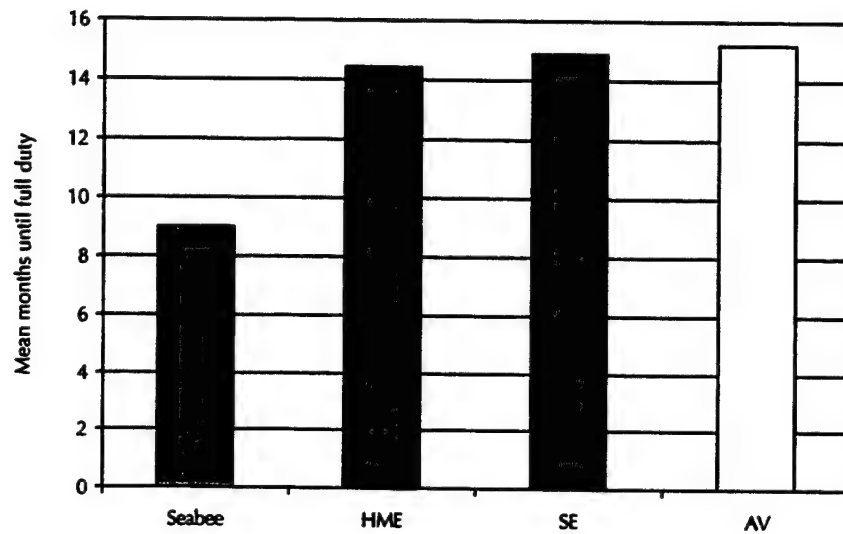
a. Source: CNA tabulations of EMR data.

Distribution by LOS rather than paygrade also shows that Seabees are more junior than our comparison groups, with a larger LOS 0-6 share and a smaller share in the LOS 11-20 and 20-plus groups.

The relative lengths of the groups' training pipelines may explain this difference. As figure 31 shows, Seabees reach full-duty status in about 9 months, compared to 14-15 months for enlisted personnel in the comparison groups. Similarly, the average paygrade at time of full

duty is 1.75 for Seabees compared to between 2.34 and 2.46 for those in the SE, HME, and AV groups. This relatively short training pipeline helps to explain the younger and more junior Seabee distribution.

Figure 31. Shorter training pipeline may cause more junior Seabee force structure^a



a. Source: CNA tabulations of EMR data.

Appendix B: Demographic profile of Seabees

This appendix presents summary statistics for OF-13 Seabees. Table 6 reports the share of our FY01 EMR sample with each characteristic (mean values are given for length of service and age).

Table 6. Demographic characteristics of the Seabee population, FY01

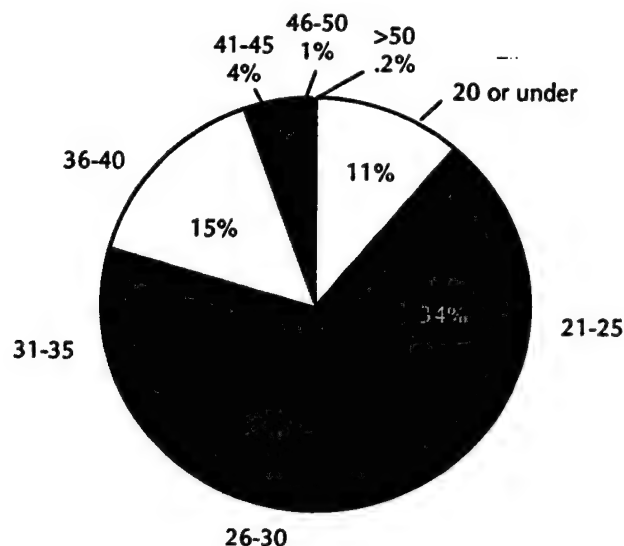
Characteristic	Share
Length of service (years)	7.8
Age (years)	28.4
Married	47.9%
Male	94.0%
White	70.5%
Black	11.7%
Hispanic	9.1%
Asian/Pacific Islander	5.9%
Other	2.7%
No high school degree	2.5%
High school diploma	91.6%
High school certificate	3.9%
Home schooled	0.4%
Education level unknown	1.5%

Seabees were initially recruited civilian construction workers; their average age during WWII was in the mid-thirties [9]. Today's Seabees are grown from within the Navy, and the average age has dropped considerably. As figure 32 shows, 45 percent of today's Seabees are under age 25. This is still slightly lower than the average share for all Navy enlisted, which stood at 49.6 percent in 2000 [10].

In terms of their marital status, Seabees are quite similar to their other enlisted counterparts—about half are married. However,

94 percent of Seabees are male compared to about 86 percent of the entire Navy enlisted population [10].

Figure 32. Today's Seabees are relatively young, FY01^a.



a. Source: CNA tabulations of EMR data.

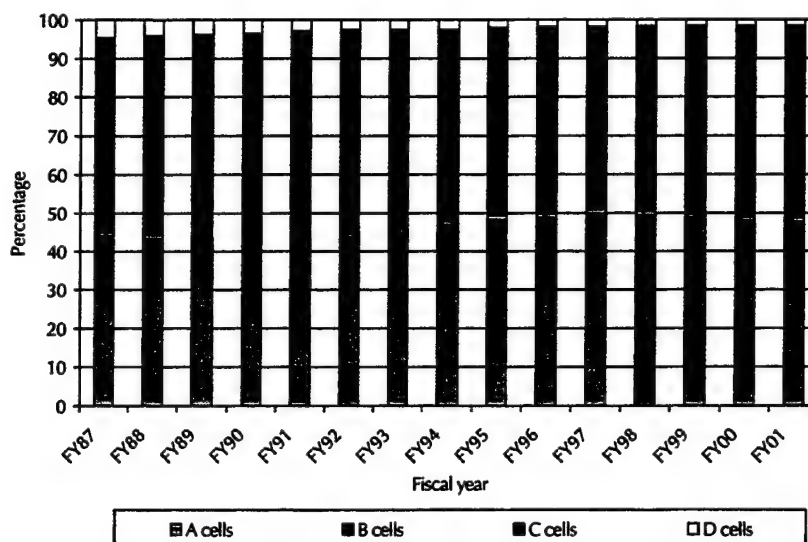
Between 1987 and 2001, the overall quality (as measured by AFQT scores and graduation status) of the enlisted Seabee stock improved (figure 33). In 1987, 45 percent of Seabees were A cells—a share that rose to 50.9 percent in 1997.¹ Within the last several years, however, there has been a slight reversal, with the share of A cells falling to 48.7 percent. Similarly, the share of B cells has also increased.

The enlisted Seabees in our primary sample belong to a family of construction ratings. Data show that over one-quarter of enlisted Seabees held the BU rating in 2001, followed by 18 percent in the CM rating

1. A cells are those in the top 50 percent of AFQT scores who are also high school graduates. B cells are those in the top 50 percent of AFQT scores who are not high school graduates. Similarly, C cells are in the bottom half of the AFQT distribution, but are high school graduates, and D cells have low AFQT scores and are not high school graduates.

and 15 percent in the EO rating. Smaller shares filled the remaining OF-13 ratings. The three consolidated E-9 ratings accounted for a little over 1 percent of our enlisted Seabee population (figure 34). Several rating shares have changed over the 1987-2001 period, with strong growth in the E-9 grades (up 25 percent) and among the CMs (up 15 percent), but with decreased shares of UTs (down 20 percent) and EOs (down 18 percent).

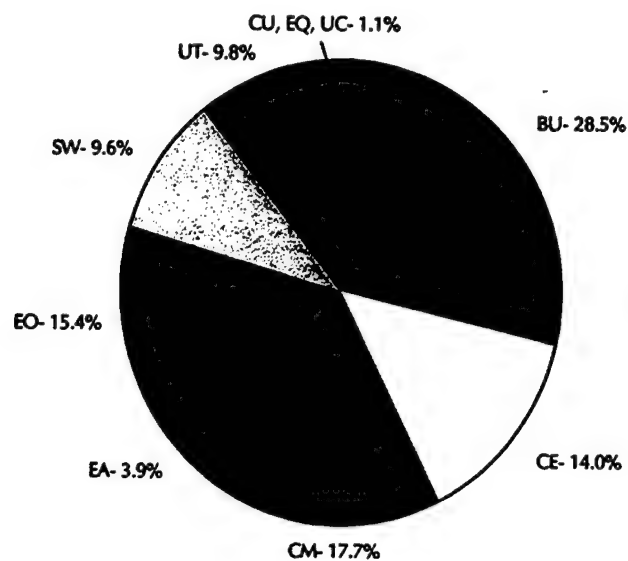
Figure 33. Seabee quality falling in recent years^a



a. Source: CNA tabulations of EMR data.

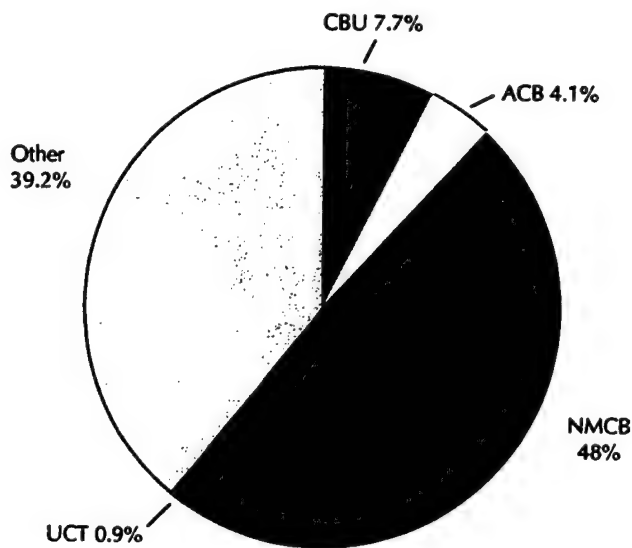
Figure 35 shows the distribution of these active-duty personnel among Naval Mobile Construction Battalions (NMCBs), Naval Amphibious Construction Battalions (ACBs), Underwater Construction Teams (UCTs), and Construction Battalion Units (CBUs). Personnel in NMCBs, ACBs, and UCTs are typically at sea, whereas those in CBUs and "other" organizational structures are primarily at shore. There are currently 8 NMCBs (4 based in Gulfport, MS, and 4 based in Port Hueneme, CA), 2 ACBs (based in Norfolk, VA, and Coronado, CA), 2 UCTs (based in Little Creek, VA, and Port Hueneme, CA), and 19 CBUs (based in various U.S. locations).

Figure 34. Seabee rating distribution, September 2001^a



a. Source: CNA tabulations of EMR data.

Figure 35. Seabee organizational distribution, FY01^{a,b}



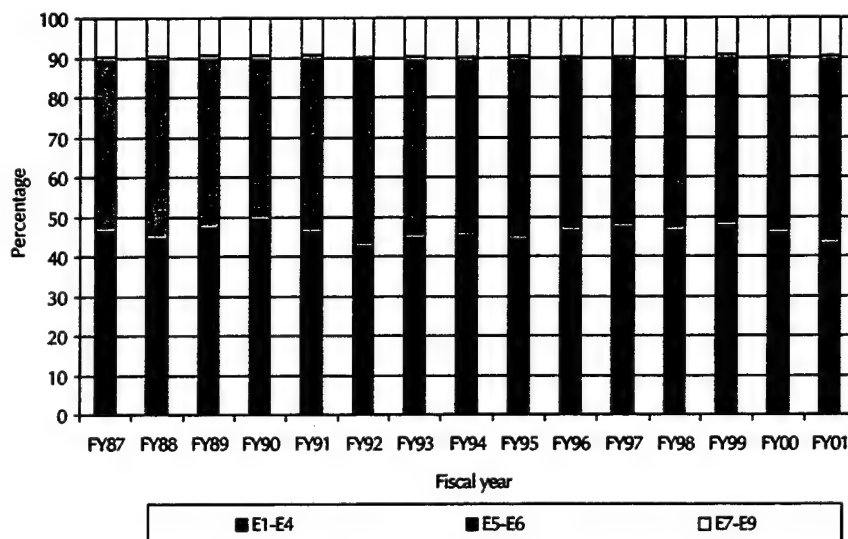
a. Source: CNA tabulations of EMR data.

b. Note: Other includes other shore billets and those who are in school.

The enlisted Seabee inventory has fluctuated considerably over time, as changing operating conditions and environments have dictated needs. For example, during the height of WWII, the number of Seabees swelled to over 325,000 [9]. The number of enlisted OF-13s, which peaked in most recent years before the military drawdown at 10,968, has dropped almost one-quarter since. Most of this decrease was the result of reductions in Seabees with 6 or fewer years of service, as new assessments were cut and more senior members were retained during the drawdown.

Figure 36 shows Seabees' paygrade distribution over time. The share of junior personnel (E-1-E-4) fell over the drawdown, rebounded for a period, but has fallen again in recent years. The share of mid- and senior-grade Seabees has increased since the beginning of the drawdown effort, from 41.6 to 47.5 percent and from 9.1 to 9.6 percent, respectively.

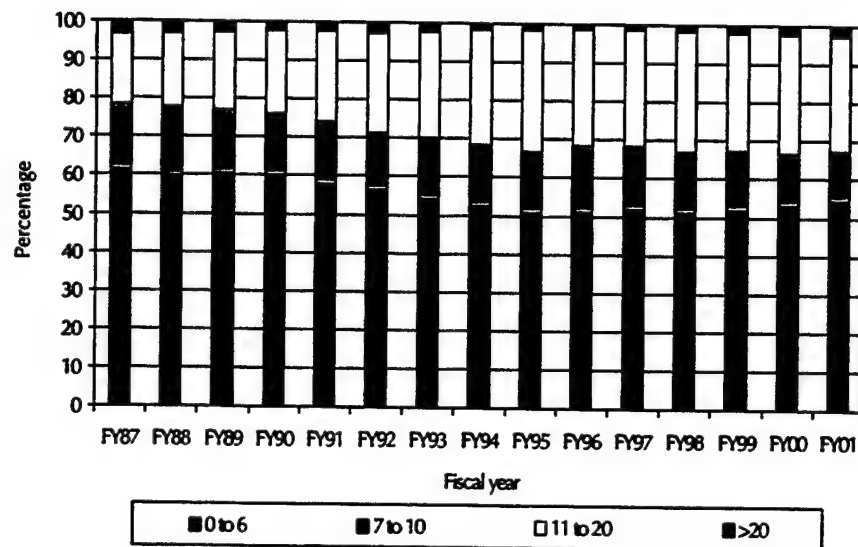
Figure 36. Seabee force more senior post-drawdown^a



a. Source: CNA tabulations of EMR data.

An examination of Seabees' paygrade distribution, while useful, may camouflage underlying trends if less experienced individuals must advance to fill existing vacancies within a relatively fixed paygrade structure. Figure 37 shows that the Seabee force became more senior over the drawdown as the share of Seabees in LOS 0-6 shrank and the share of those in LOS 11-20 grew accordingly. This trend has started to reverse itself in the past several years, with the LOS 0-6 share increasing 3 percentage points since FY98. The Seabee force is expected to become increasingly youthful in the future as the relative surplus of more senior members built up during the drawdown reaches retirement.

Figure 37. Seabee seniority starting to decrease after drawdown-induced increases^a

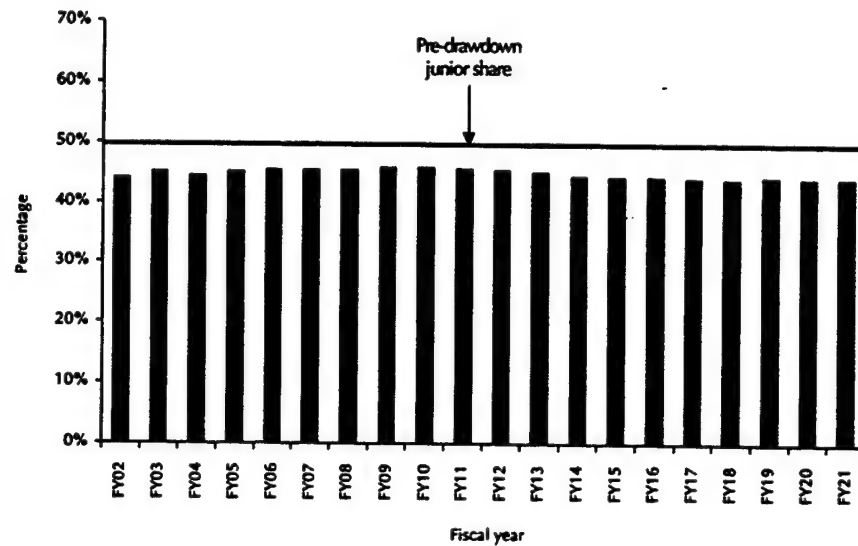


a. Source: CNA tabulations of EMR data.

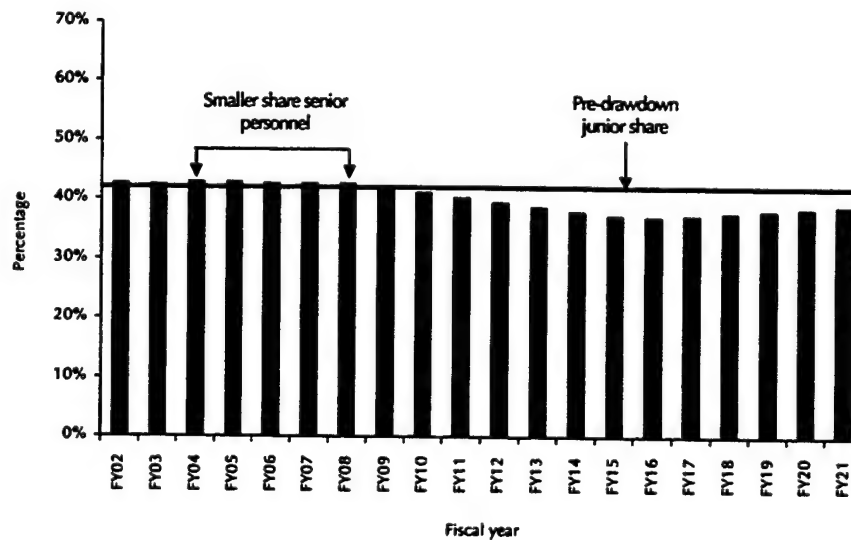
Appendix C: Inventory aging analysis

Finally, we assess how attrition and reenlistment trends will affect the development of the future Seabee force. Using assession data and continuation rates (which capture both attrition and reenlistment behavior), we estimate inventory aging. In the model, we use the pre-drawdown share of junior personnel (those with 0 to 4 years of service) as a benchmark. We then estimate changes in cohort shares as the force ages over time. If the force's junior share rises above its pre-drawdown levels, this is indicative of a relatively younger force—which may lack sufficient experience. A small senior cohort may require more rapid advancement to fill leadership voids, which could result in a less experienced and capable force. As figure 38 shows, the Seabees' junior cohort is anticipated to remain below its pre-drawdown level over the FY01-FY21 time period. Thus, we see little evidence that senior retirements will create a dearth of experience in the future Seabee force.

Our examination of comparison group data, however, shows a very different outcome. As figures 39 through 41 show, each comparison group will experience a growing junior share (indicating a shortfall in experience levels) within the next ten years. The AV group will first experience this problem in FY04, when shares with 0-4 and 5-8 YOS will exceed shares experienced before the military drawdown. In FY04 and FY05, the share of those with over 13 YOS will exceed its pre-drawdown share, and will then fall below after FY06. Senior personnel shortfalls will persist until FY09. The SE community will experience a growing junior share over the FY06-13 period, with smaller shares of those with 9-12 and 13+ YOS occurring after FY08. Finally, the HME group's junior share will grow during FY07-12, with fewer mid- and senior-grade personnel over most of this period.

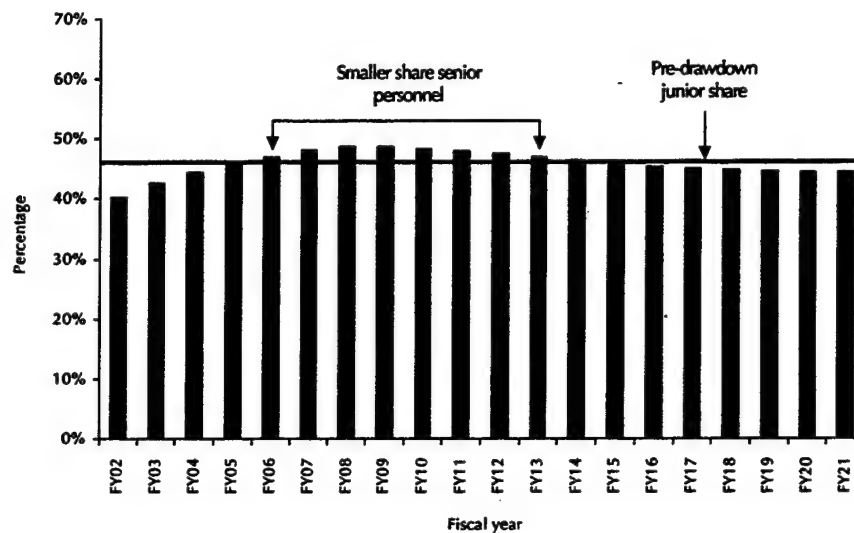
Figure 38. Future Seabee junior cohort levels^a

a. Source: CNA tabulations of EMR and billet file data.

Figure 39. Future AV junior cohort levels^a

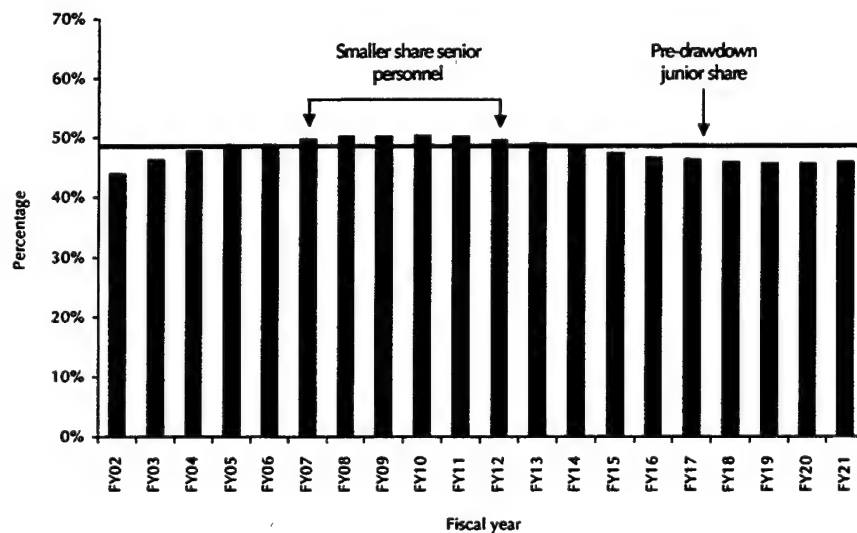
a. Source: CNA tabulations of EMR and billet file data.

Figure 40. Future SE junior cohort levels^a



a. Source: CNA tabulations of EMR and billet file data.

Figure 41. Future HME junior cohort levels^a



a. Source: CNA tabulations of EMR and billet file data.

These results suggest that—unlike our comparison groups—the Seabee force is not facing imminent shortfalls of senior personnel as a result of aging and force retirements. The main reason for this is the smaller degree to which the Seabee force contracted over the military drawdown. Because cuts were less severe, Seabees were able to sustain cohort sizes to ensure sufficient future senior leadership.

Appendix D: Career Sea Pay (CSP), the Career Sea Pay Premium (CSPP), and recent reforms

Much of the information in this appendix is detailed in [12]. This appendix excerpts portions of their discussion.

CSP and the CSPP

Career Sea Pay and the Career Sea Pay Premium are payable to those serving on sea duty. Before October 2001, CSP receipt varied from \$50/month to \$520/month and was based on rank and years of cumulative sea duty. Those below paygrade E-4 and officers with less than 3 years of cumulative sea duty were not eligible for CSP (table 7 reports CSP available to enlisted servicemembers).

In addition to CSP, those on sea duty may be eligible for the CSPP). CSPP—a fixed, monthly payment (currently set at \$100/month) designed to provide incentives for long sea tours. Sailors and officers are eligible for the premium when serving more than 36 consecutive months of sea duty. Before October 2001, enlisted personnel in paygrades E-5 and above with over 5 years of cumulative sea duty could not receive the premium; instead, a higher rate, not contingent on consecutive sea time, was embedded in the CSP table.

Sea pay reform

Effective October 1, 2001, the Navy fundamentally restructured its sea pay program. Under this reform measure (referred to as enhanced sea pay), existing CSP rates increase (the top rate is now \$700/month) and CSP is extended to E-1–E-3 enlisted and officers with less than 3 years of sea duty. In addition, qualifying enlisted E-5–E-9 personnel now receive CSPP as a separate payment through the 7th year of sea duty. With over 8 years of sea duty, the premium is embedded in the CSP table and is not contingent on consecutive sea time (table 8 reports CSP currently available to enlisted servicemembers).

Table 7. Enlisted monthly CSP by paygrade, effective 1 July 2000

Cum. years of sea duty	CSP by paygrade (\$)				
	E-4	E-5	E-6	E-7-E-8	E-9
1 year or less	50	50	100	100	100
Over 1 year	60	60	100	100	100
Over 2 years	120	120	120	120	120
Over 3 years	150	150	150	175	175
Over 4 years	160	170	170	190	190
Over 5 years	160	315	315	350	350
Over 6 years	160	325	325	350	350
Over 7 years	160	350	350	375	375
Over 8 years	160	350	350	390	390
Over 9 years	160	350	365	400	400
Over 10 years	160	350	365	400	400
Over 11 years	160	350	365	410	410
Over 12 years	160	350	380	420	420
Over 13 years	160	350	395	450	450
Over 14 years	160	350	410	475	475
Over 16 years	160	350	425	500	520
Over 20 years	160	350	425	500	520

These changes imply a substantial increase in the amount of sea pays available to shipboard servicemembers. For example, combining data on average sea tour lengths with conservative promotion rate assumptions, we estimate that an MS could earn an additional \$10,420 (in unadjusted current dollars) over a 20-year career.

Sea pay eligibility

Although CSP and CSPP rates have changed, basic eligibility requirements for sea pay receipt remain the same. According to U.S. Code, Title 37, Section 305a, "sea duty qualifying for sea pay" is duty performed by a servicemember:

- a. While permanently or temporarily assigned to a ship, and
 - While serving on a ship, the primary mission of which is accomplished while under way; or
 - While serving as a member of the off-crew of a two-crew submarine; or

- While serving as a member of a tender-class ship (with the hull classification of submarine or destroyer).
- b. While permanently or temporarily assigned to a ship and while serving on a ship, the primary mission of which is normally accomplished while in port, but only during a period that the ship is away from its home port [which it defines as (a) at sea or (b) in a port that is more than 50 miles from its home port].
- c. While permanently or temporarily assigned to a ship-based staff or other unit (at the discretion of the Secretariat).

Table 8. Enlisted monthly CSP for paygrades E-1 through E-9, effective 1 October 2001

Cum. years of sea duty	CSP by paygrade (\$)								
	E-1	E-2	E-3	E-4	E-5	E-6	E-7	E-8	E-9
1 year or less	50	50	50	70	70	135	135	135	135
Over 1 year	50	60	60	80	80	135	135	135	135
Over 2 years	50	75	100	160	160	160	160	160	160
Over 3 years	50	75	100	280	280	280	305	305	305
Over 4 years	50	75	100	290	300	300	320	320	320
Over 5 years	50	75	100	290	315	315	350	350	350
Over 6 years	50	75	100	290	325	325	350	350	350
Over 7 years	50	75	100	290	350	350	375	375	375
Over 8 years	50	75	100	390	450	450	490	490	490
Over 9 years	50	75	100	390	450	460	500	500	500
Over 10 years	50	75	100	390	450	465	500	500	500
Over 11 years	50	75	100	390	450	465	510	510	510
Over 12 years	50	75	100	390	450	480	520	520	520
Over 13 years	50	75	100	390	450	495	550	550	550
Over 14 years	50	75	100	390	450	510	575	575	575
Over 16 years	50	75	100	390	450	525	600	600	620
Over 18 years	50	75	100	390	450	550	600	620	620
Over 20 years	50	75	100	390	450	550	600	620	620

As a result of these eligibility requirements, crews on deploying ships and submarines are eligible for continuous sea pay (whether deployed or in home port¹), whereas crews of squadrons and most ship-based staffs can only receive sea pays while deployed at sea.

These restrictions mean that Seabees—unlike their shipboard counterparts—do not receive sea pays over the course of their sea tours. Non-OF-13s do not receive sea pays during any sea tour served with a Naval Mobile Construction Battalion (NMCB). Both Seabee groups only receive sea pays for days spent under way at sea. In other words, the vast majority of Seabee sea tours count as sea duty for rotational purposes, but do not count toward the receipt of sea pays.

Evidence on the effectiveness of sea pays

There is good evidence that changes in sea pay receipt can promote sea tour extensions, help to more effectively distribute personnel, and encourage lower attrition and higher reenlistment rates.

Sea Pay's role in encouraging sea tour extensions

Navy manpower analysts examining the effect of 1981 sea pay increases found that they prompted a 58-percent jump in tour extensions. The analysts concluded that "the gross statistics, therefore, appear to show that sea pay is a primary factor in encouraging voluntary duty at sea" [11].

Recent CNA research finds similar results [3]. The Navy's highest completion rates in the last decade occurred in the years surrounding the FY89 sea pay increase. Sea duty extensions peaked at 14 percent in FY89—the year of the sea pay changes.

Finally, several surveys have found that Sailors are willing to extend on sea duty for additional pay. Previous CNA research analyzing responses from the 1996 Navy Homebasing Survey suggest that Sailors were willing to extend their sea tours at least 1 year for a sea pay increase of \$150 a month and homebasing. Using other survey data and the EMR, the analysts constructed adjusted response rates to quantify how many additional Sailors would extend for additional sea pay alone.² Response rates suggest that over 30 percent of eligible

1. A typical Navy deployment schedule is 6 months deployed, followed by 12 or more months in home port.
2. The methodology is described in detail in [6].

Sailors would extend their sea duty at least 1 year for a sea pay increase of \$150 per month.

Sea pay as a distribution and retention tool

CNA research on sea pay reform, using the BuPers Annualized Cost of Leaving (ACOL) model, estimated sea pay's retention effects [3]. The analysis showed that the effects depend critically on whether an increase in sea pay was targeted to Sailors at the reenlistment point or was spread evenly across the sea duty population. For example, increasing sea pay back to its real purchasing power in FY89 (about a \$92-million increase) across the board increased Zone A retention by about 0.5 percentage point. If, instead, pay was concentrated on the sea duty population near a reenlistment point, retention increased by over 1 percentage point. The researchers concluded that sea pay is an effective distribution tool and is only secondarily a retention tool.

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